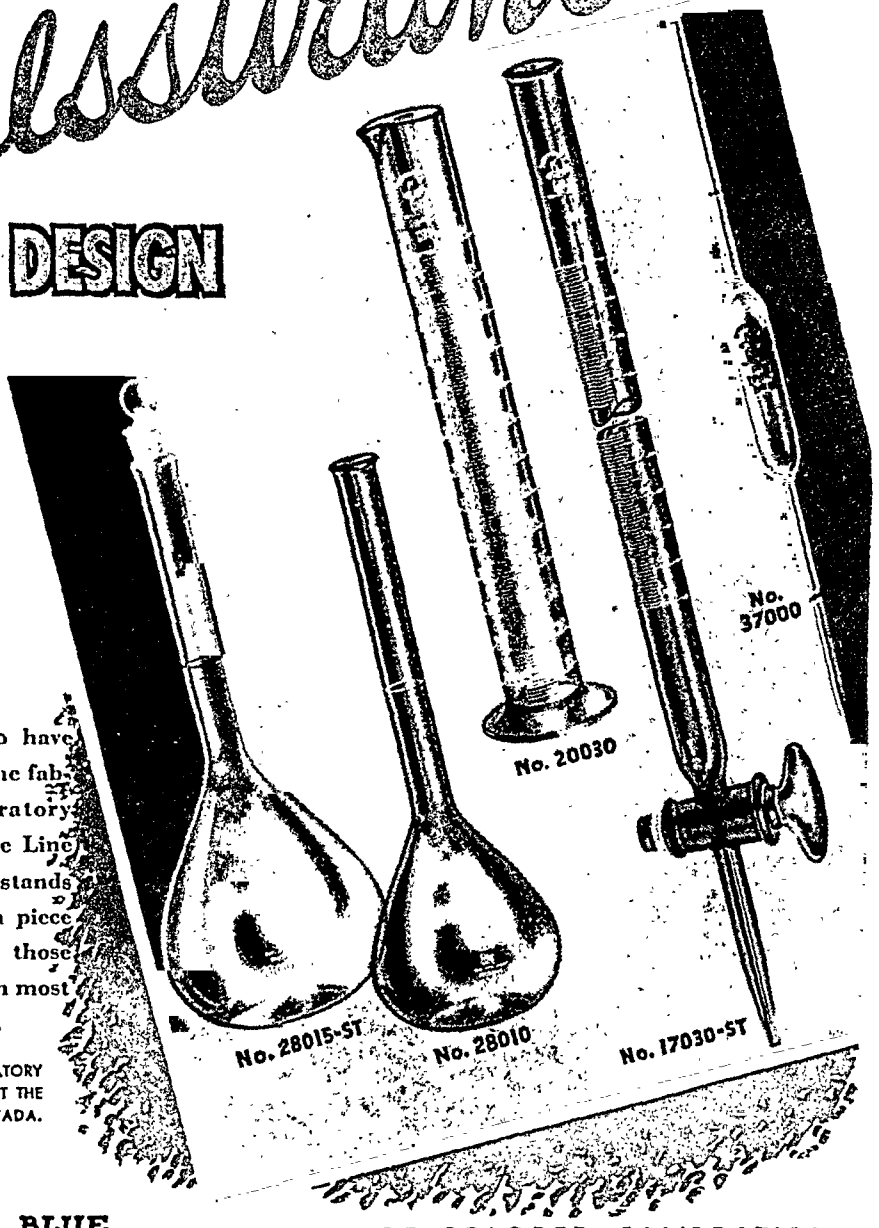
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American Journal of Public Health
and THE NATION'S HEALTH

Official Monthly Publication of the American Public Health Association

Volume 30 — July, 1940 — Number 7

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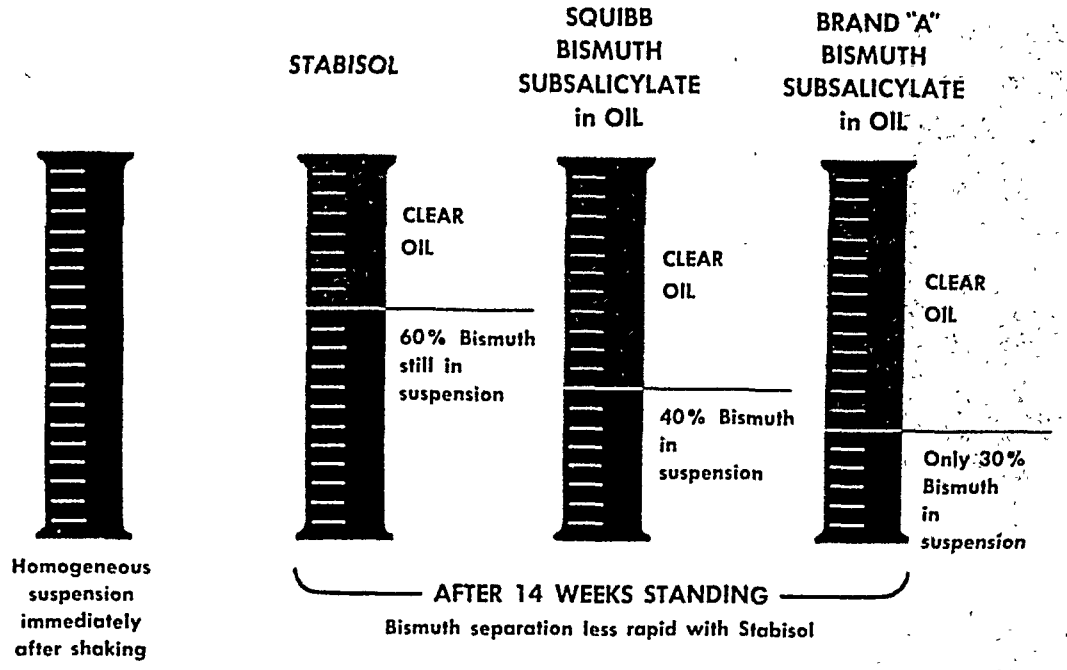
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American Journal of Public Health
and THE NATION'S HEALTH

Volume 30 July, 1940 Number 7

Development of Medical Care Plans for Low Income Farm Families*

Three Years Experience

R. C. WILLIAMS, M.D.

Chief Medical Officer, Farm Security Administration, U. S. Department of Agriculture, Washington, D. C.

THE program under which more than 100,000 low-income farm families, borrowers from the Farm Security Administration, are at present obtaining medical care, grew out of an economic necessity. It has appeared as an incidental by-product of a depression-born program of farm loans which were made exclusively to families unable to obtain credit from any non-governmental source. It is designed to accommodate a very special economic group only. It is governmental only in that its organization is sponsored and its operations are partly financed—through loans to its debtor families to enable participation by a governmental credit agency which has loaned several hundred million dollars with little security except the character and productive ability of families receiving medical aid under the arrangements.

Its background explains much of its organization and method.

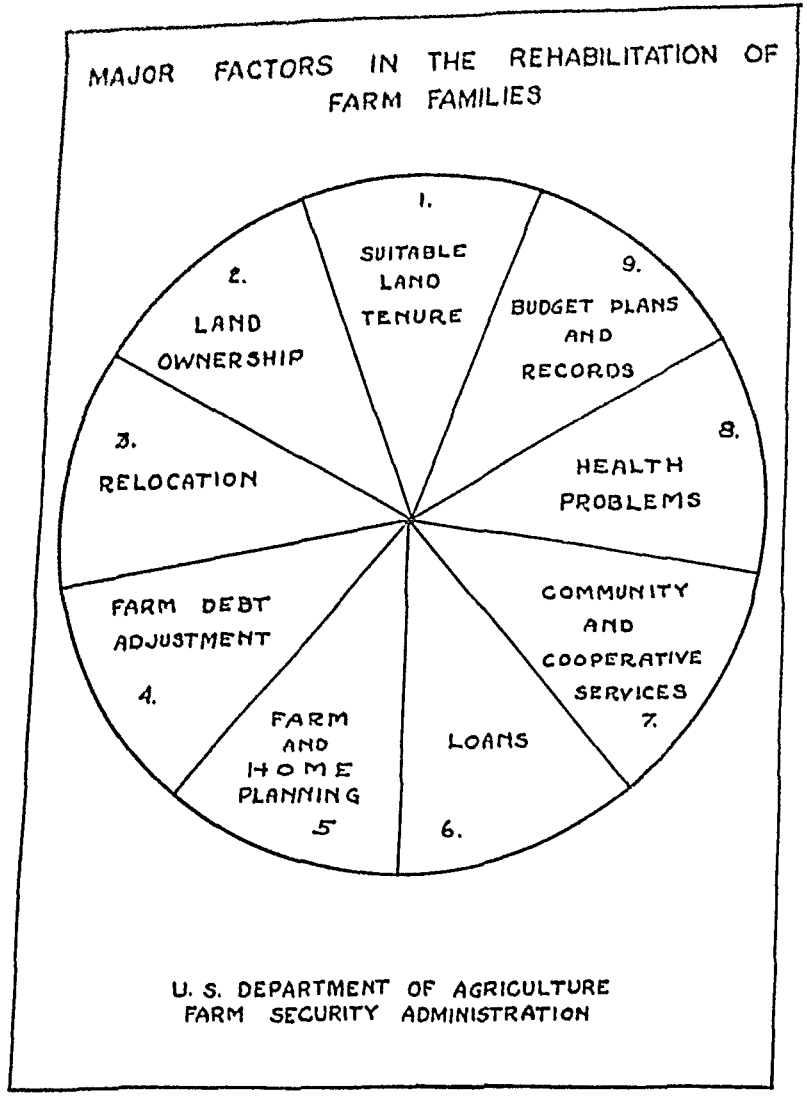
Five years ago, three million farm families were on the brink of disaster. Flood and drought had played havoc with crops. The depression brought economic chaos to an already unstable farm economy. Credit had vanished; crops were selling at low prices. It was a period of foreclosures and "penny" auctions. The wholesale migration of farm families from one farm area to another seeking an opportunity for livelihood became a common phenomenon.

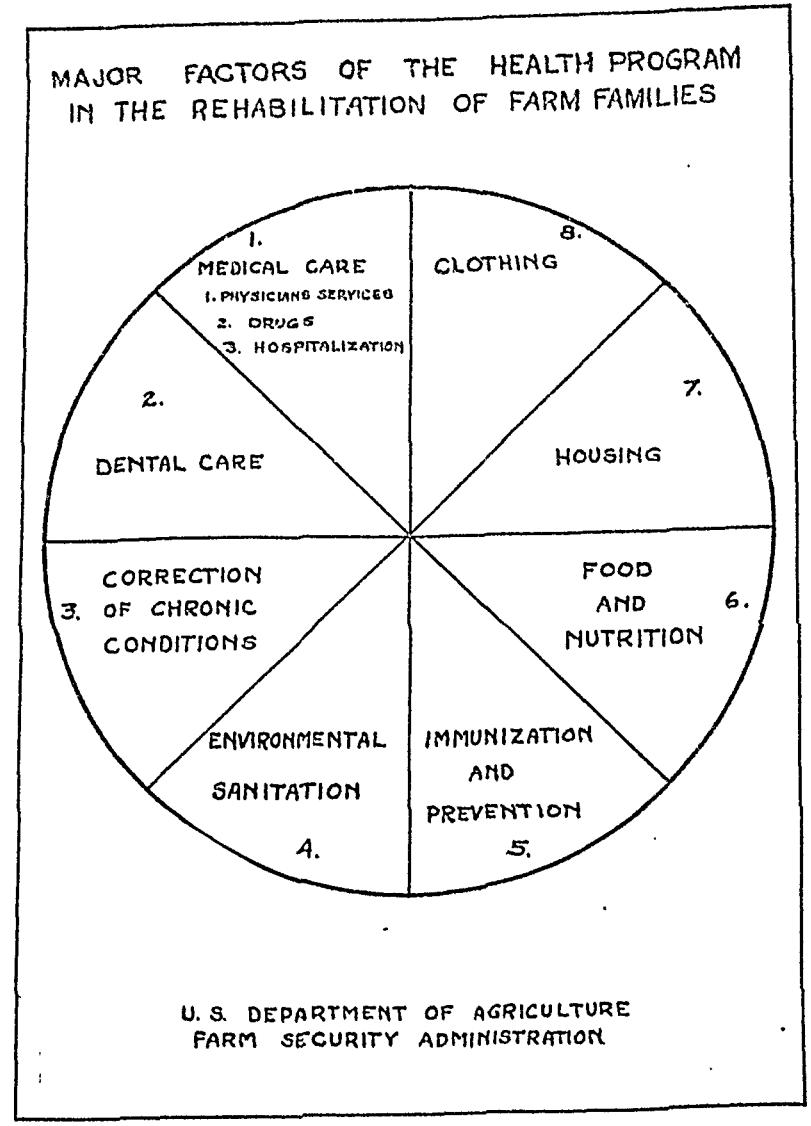
For roughly one-fourth of the farm population, relief was the only means of living until the Farm Security Administration offered to make small loans to enable farmers to continue planting their crops.

The Farm Security Administration makes these loans, repayable within 5 years at 3 per cent, so that farmers may buy the feed, seed, and tools necessary for the year's operations. Often the loans must help the farmer to meet the expenses of clothing and feeding his family until he makes a crop.

Before a farmer can receive a loan he fulfils the following requirements:

* Read before the Health Officers Section of the American Public Health Association at the Sixty-eighth Annual Meeting in Pittsburgh, Pa., October 19, 1939.


MAJOR FACTORS IN THE REHABILITATION OF FARM FAMILIES
1. SUITABLE LAND TENURE
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5. FARM AND HOME PLANNING
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FARM SECURITY ADMINISTRATION


MAJOR FACTORS OF THE HEALTH PROGRAM IN THE REHABILITATION OF FARM FAMILIES
1. MEDICAL CARE
1. PHYSICIANS SERVICES
2. DRUGS
3. HOSPITALIZATION
2. DENTAL CARE
3. CORRECTION OF CHRONIC CONDITIONS
4. ENVIRONMENTAL SANITATION
5. IMMUNIZATION AND PREVENTION
6. FOOD AND NUTRITION
7. HOUSING
8. CLOTHING
U. S. DEPARTMENT OF AGRICULTURE
FARM SECURITY ADMINISTRATION

1. He must be unable to obtain either funds or satisfactory credit from any other source, public or private.
2. He must know how to run a farm or have derived the major part of his income for the previous six months from farming operations.
3. He must be approved for the loan by a local county committee, generally composed of two or three farmers and one or two business men who can attest character and ability.
4. He must be able to do the farm work.
5. He must be renting a farm or have an equity in a farm.

All loans are based on adequate guidance of the family during the period in which they are trying to reëstablish themselves. The purpose of loans and guidance is to make the families again self-supporting and self-reliant. The major factors given emphasis in undertaking to aid the rehabilitation of a family are: suitable land tenure, adequate equipment, adjustment of any over-burdening previous debts, sound planning of farm and home management, use of community and coöperative services to supplement family equipment, adequate financing at reasonable rates of interest, careful budgeting and record keeping. Farm Security Administration supervisors work with the farmer until the loan is repaid, helping him to plan his farm enterprise and advising him on more effective methods of raising crops or conserving the soil. Home management supervisors periodically visit the farm wives and advise them on their problems of canning, raising garden produce, sewing, and other work of the homemaker involving the success of the family enterprise.

LOANS DEFAULTED

It was through these county supervisors, who are constantly in touch with borrower families, that the first inklings of a serious gap in the program's early efforts were called to the attention of administrators. Difficulty in working with some of the families was traced to lack of medical attention—to acute illness, abscessed teeth, hernias, malaria, and other conditions. It was reported that loans were defaulted as chickens, hogs, or calves were sold to pay for medical bills. When families had no money to pay for physicians' services, avoidable deaths occurred and the government lost the money it had invested.

An investigation of a sample of Farm Security Administration borrowers who had failed revealed that 50 per cent of the "failure" cases were directly traceable to "bad health." Aside from the wanton waste of human life and curtailment of borrowers' usefulness to themselves, some kind of medical care program was plainly indicated to the Farm Security Administration from a purely economic point of view by the findings of this survey.

The basis of the medical care program is a conviction that a family in good health is a better credit risk than a family in bad health. Economic security depends to a large extent on health security.

The Farm Security Administration loan program was in jeopardy until some feasible plan for getting medical aid for its farmers could be found.

THE MEDICALLY INDIGENT

Once the need was recognized, the next step was to get medical aid to needy borrower families who could not obtain it through regular channels. There was no organized system of providing medical care for medically indigent rural families in most of the states. In a few states, the families had to be certified as paupers before any medical aid was given. In one state, a "Black List" of patients who had not paid their doctor bills prevented physicians from attending indigent cases on pain of expulsion from the local medical society. Nothing could be done for these families without the help and understanding of the medical profession.

The gap between the families needing medical attention and the physicians who could render it was not simple to bridge.

Due to the cost and delay involved in making a loan, and the additional difficulties of auditing and individually justifying expenditures for medical care by borrowers, it was not feasible for the Farm Security Administration to make small supplemental loans to its borrowers to help them meet medical care bills as they were presented. A single loan to each family at the beginning of the year to cover medical care for the 12 months was precarious. The incidence of disease among individuals is not exactly predictable; and it was certain that in some instances where serious illnesses developed, any probable sum set aside would be inadequate to cover costs for the family stricken; either the bill would go unpaid or the family would be bankrupted, the loan advanced by the Farm Security Administration defaulted, and the work of rehabilitation left to begin again. In other instances, the sum loaned for medical care would be too much.

In order to avoid the occasional family financial disasters and the defaulting of medical care bills which the loans were intended to forestall, it seemed necessary to persuade borrowers to pool the funds loaned to each for medical care at the beginning of the year, so as to give each family assurance of all needed care as well as to keep medical costs within their ability to pay. Finally, it was necessary that physicians, assured that each of these near-relief families was paying according to its ability into the pool, should accept as payment for services that proportion of their regular fees which funds in the pool would cover.

When a medical care program was started in 1936, however, the principle of prepayment for medical services had not yet been accepted by the medical profession. And while insurance for protection against loss of life, threat of fire or theft were old stories to the American public, the banding together of a group of people for mutual protection against the incidence of illness was new to the public and viewed with misgivings.

The families which had borrowed from Farm Security Administration had learned the rudimentary lessons of coöperation for their everyday needs by buying plows, livestock for breeding purposes, or canning equipment in groups for the use of all participants. This form of coöperation, however, showed immediate results in the use of the purchased article. Paying a flat sum for medical care was somewhat of a risk. You might be sick this year, and then again you might not. It was a higher type of coöperation that these families would have to accept voluntarily.

On the other hand, two facts argued the feasibility of the plan: (1) these farm families realized they had desperate need for such a service and wanted it, and (2) physicians—especially rural physicians—were anxious to readjust a system of compensation which left them after a period of years with thousands of dollars worth of unpaid bills on hand.

The only feasible approach to the problem, at any rate, seemed to be the grouping of families under a plan, paying a flat fee per year for medical care, and the participation of physicians who would agree to treat these families at a uniform fee schedule which would take into account the families' low income.

State medical associations were approached with tentative outlines for medical care plans. The plans were framed so that existing local facilities would be used in every case, and that participation fees would be based on the ability of the family to pay—a principle long recognized and put into

practice by the medical profession. Not all state medical associations have yet been approached—the present program only started in the spring of 1937—but already 26 state medical associations have approved medical care plans.

In some states, the state medical association welcomed the opportunity of trying out an experiment which was obviously necessary and about which they had long wondered. Other state medical associations accepted the plan on sufferance with the understanding that it was purely on a trial basis.

THE PLANS

A great variety of plans has been initiated, but, in general, they follow three patterns. In most of the plans, borrower families pool their funds and put them in charge of a trustee.* The trustee then pay all physicians' bills for the group as fully as funds will allow, on a monthly, pro rata basis. Under another plan which is gradually being discontinued, funds for each family are placed in the hands of a trustee, but separate accounts are kept for each family. The third kind of plan provides that an association of Farm Security families—grouped together on projects—may employ one or more physicians on a salary basis to provide necessary medical aid.

Meetings with the economic committee or council of the state medical association are usually held, at which a memorandum of understanding or a guide to be used as a basis for developing local health service associations within the state is worked out. These memoranda of understanding are prepared by the officials of the state medical associations, with the assistance of officials of the Farm Security Administration. The usual policy of the state associations has been to refer the memorandum back to the house of delegates of the state medical association for final endorsement. In some states, simple resolutions were adopted by the house of delegates referring this matter back to the local medical societies to be worked out, without specific recommendations. Based on these memoranda or resolutions, agreements are then worked out with local medical societies.

The basic procedure in each case, however, is the same, although state and county differences are apparent in most plans. Before any medical care plan is set up for Farm Security Administration borrowers, county supervisors — the people who are directly in contact with the families—are asked if there is a need for a medical program revealed in the current farm and home plans of the family. If there is a need and a desire on the part of the families to participate in such a plan, representatives of the Farm Security Administration charged with the responsibility of carrying out the program approach the local medical society. A common understanding of the benefits that should be included in the medical program and a reasonable family fee, based on income indicated in the farm and home plans, is reached before the matter is laid before the families.

The agreements with the county societies recognize the three basic principles of the medical program: (1) the participation fee for borrower families is based on their ability to pay as determined by their farm plans; (2) there is free choice of physicians who agree to participate; (3) funds are set aside in the hands of a bonded trustee at the *beginning* of the operating period.

The medical benefits covered in the

* When a family borrowing from the Farm Security Administration lacks funds at the beginning of the year to make its payment into the fund, the Farm Security Administration will increase the amount of the general loan for rehabilitation by the sum necessary to permit its participation. No separate loan for medical purposes is made; participation in the medical care program is regarded as quite as necessary to sound farming as is adequate workstock, and no distinction between moneys for the two purposes is made either in loaning or collection processes.

plan usually include: (a) ordinary medical care, including examination, diagnosis, and treatment in the home of the family or in the office of the physician; (b) emergency surgery necessary to save the life or limb of the individual as determined by the physician in charge of the case; (c) emergency hospitalization believed necessary and recommended by the attending physician; (d) obstetrical care, including prenatal, delivery, and postnatal care services; (e) ordinary drugs dispensed or prescribed by attending physician; (f) in some areas, dentistry prescribed by attending physician and believed necessary to relieve acute systemic diseases or to relieve pain.

PAYMENT FOR SERVICES

For these services the family under the most typical agreement usually pays from $15 to $30 a year. The amount paid varies according to benefits included under the plan, according to size of average farm incomes in the locality, and according to size of family. A typical payment schedule for physician's care in a low-income county might be an annual $18 for man and wife with an additional $1 for each child up to 8, with a maximum payment of $26 per family. The money is pooled and a certain amount is allocated for hospitalization and emergency needs, including surgical care, at the beginning of each period. The remaining fund is then divided into equal monthly allotments for the period covered.

Physicians submit monthly statements based on a fixed fee schedule to the trustee for services rendered. These bills are reviewed by a committee from the local medical society. If the total bills for a given month exceed the amount available, all bills are proportionately reduced and each physician paid his pro rata share of the month's allotment. If the allotted funds for the month are sufficient, the bills are paid in full; if a balance remains, it is carried forward to the next month or to the end of the period, and then used to complete paying bills for months in which funds were not adequate.

The pool plans vary as to organization. While under many of the county pool medical care plans the farmer-participants are formally organized into unincorporated associations; others are informal groups with the trustee responsible for funds and the reviewing committee of physicians responsible for checking the bills.

Benefits included under the medical care plans also vary according to the participation fee and local needs. The percentage of money set aside from the total funds for hospitalization, drugs, and physicians' services are worked out with the local county medical societies. The majority of county pool plans cover emergency medical care, including obstetrics and hospitalization. Forward looking counties have also added dental services, while a few plans provide only for emergency medical care. In one state, 40 counties have plans for dental care which are operated on a separate basis. For $3.50 a year for each family and $.50 in addition for each person in the family the participating family obtains emergency treatment, simple fillings, extractions, prophylaxis, and cleaning.

Drugs are sometimes a problem under the plans. Unless druggists coöperate * with the program, it is found that an unusually high percentage of the funds —sometimes as much as 35 per cent— must go to pay the standard price of drugs; from 7 per cent to 12 per cent is more nearly normal. In a number of plans, however, physicians dispense the drugs they prescribe or have the prescriptions charged to themselves. The most ideal solution, of course, would be to have the borrower families

* By accepting pro-ration of bills along with physicians or giving a fixed discount.

pay for the drugs they might need aside from the plan. It was found, however, that because these families have such a low cash income, they were not in a position to pay for drugs and often the families could not have the physician's prescriptions filled.

In all county pool plans, there is a set fee schedule for the physicians serving the families. The individual contract plan works on an entirely different basis. Funds for each family participating are set aside and the physician of the family's choice agrees to render medical service for a certain sum a year. If the family has no illness that year, the money is refunded or applied to the next year's account. If the family needs more services than are covered by the fee it has paid, the physician continues his services free of charge during the remainder of the period.*

POOLING OF INDIVIDUAL FEES

Experiences with the two plans clearly indicate that for low-income families the first plan is preferable, that is, a plan providing for pooling of the individual fees into one general fund. In Ohio and Missouri, where the individual contract plan is in effect, results have not been wholly satisfactory and the plan may be dropped within a few months. The plan is hard on the physician when a protracted illness develops and, too often, families will not see the physician in order to save the money they have set aside for medical purposes.† Nor does the plan distribute the cost over many families, so that the cost of severe illness to one family can be more nearly equalized. In Missouri, the State Economics Committee of the Medical Association has agreed to try out a medical care plan on a pool basis in a few counties to study its merits.

County or district plans for medical care are operating as of September 30, 1939, in 21 counties in Alabama, 68 in Arkansas, 4 in Colorado, 5 in Florida, 108 in Georgia, 5 in Indiana, 1 in Idaho, 3 in Iowa, 35 in Kansas, 7 in Louisiana, 41 in Mississippi, 12 in Missouri, 1 in New Jersey, 7 in New Mexico, 11 in North Carolina, 11 in Ohio, 11 in Oklahoma, 17 in South Carolina, 7 in Tennessee, 43 in Texas, 1 in Utah, 19 in Virginia, and 3 in Wyoming. The swift extension of the program during the last two years is indicated by the increase in the number of county plans operating in Georgia where we had 5 counties participating last year and 108 counties this year.

Agreements with the state medical associations prior to approaching county medical societies have been reached with Wisconsin, Wyoming, Kentucky, Pennsylvania, New Hampshire, West Virginia, Vermont, New York, and Washington.

There is a somewhat different approach to the problem of medical care in homestead projects established by the Farm Security Administration. In most of these communities, from 100 to 200 families have settled on adjoining farms. When these projects are located some distance from cities, the problem of medical care for the homesteaders is often an acute one. In a few instances, they have employed a physician living nearby on a part-time basis. Occasionally, it has been necessary to attract a resident physician to the project by setting up a program providing a basic guaranteed income. In most cases, however, the services of all nearby physicians are utilized. Medical care programs have been organized in

* The Farm Security Administration through its local supervisors keeps in touch with the working of the plans where they are set up, but has no authority over them—loans are to the individuals to enable participation, not to the group or association organized to obtain medical aid.

† A collateral function of the prepayment feature of the plans is that of encouraging acceptance of preventive medicine by the participants. Too often low-income families in the past have habitually waited until illness became serious to the point of debilitation of the patient before obtaining medical aid.

30 projects, and programs are now being set up on 8 other projects.

In several communities the homesteaders have themselves organized voluntary beneficial associations which have worked out special agreements with physicians and hospitals. In some instances the families pay regular membership dues in cash, without help from the Farm Security Administration. In certain other projects the Farm Security Administration lends money to the homesteaders for this purpose, and these loans are later repaid when the crops are sold. A wide variety of arrangements for medical care are in effect in these community projects.

A few facts regarding a typical project program will illustrate how the medical care needs of the homesteaders are being met. Every one of the 141 families on this project became a member of the health association, paying in advance $18 per family for general practitioner care for one year. All five physicians living nearby participated, agreeing upon a uniform fee schedule which represented a moderate reduction in their usual fees. An average of 83.5 per cent payment was made on medical bills throughout the first year, the monthly payments ranging from 64.5 to 100 per cent. Of the families in the association, 96 per cent had one or more of their members receiving service during the year, and 47 per cent of the families received service for which the charges exceeded the $18 membership fee.

SPECIAL TYPES OF PROGRAM

Distinct from the general program of medical care is the program set up in North and South Dakota and in California and Arizona. These four states had local problems which made necessary a completely different type of plan. North and South Dakota had been seriously affected by the drought; California and Arizona experienced an influx of migrants living in highly unsanitary conditions who were a potential threat to the health of nearby communities.

North and South Dakota first tried a medical care program in 1936. In these two states alone, about 55,000 families were participating in a state-wide medical plan by November 1, 1938. By paying $2 a month per family for a minimum period of 6 months, families became members of the North Dakota Farmers' Mutual Aid Corporation or the South Dakota Farmers' Aid Corporation. Through these corporations they were entitled to emergency medical care, emergency dental care, emergency hospitalization, prescribed drugs and home nursing. The family had the free choice of any physician licensed to practise medicine in the state. The charges made for medical service were based on a special schedule of fees agreed to by participating physicians and other professions concerned. Bills were paid monthly and prorated if funds did not cover the full amount of the bills.

With the advent of the more general program of medical care and the experience gained from it, certain flaws were noted in the Dakota plans. Both families and physicians seemed discontented —the families maintaining that they did not receive enough services, the physicians stating that they did not receive adequate compensation for services rendered. In South Dakota, there was the additional factor that practitioners other than legally qualified doctors of medicine were seeking to participate in the medical care plan.

The uncertainty of whether funds necessary to continue the program would be appropriated by Congress caused additional uneasiness about the plans. The program was declared inoperative as of July 1, 1939, pending reorganization.

At present, North Dakota has no medical care plan, but an outline of proposed action has been drawn up.

It includes a payment of $33 per family per year to include emergency medical and dental care as well as emergency hospitalization and prescribed drugs. A higher fee was set to avoid the past experience of having insufficient funds.

A further change proposed was that the medical care program be set up on a unit basis, utilizing one or more counties as local conditions seemed to indicate, and that funds paid into the plan by the families residing in a given area be kept separate for that area, thus leaving in the hands of the families and professional groups in the district virtual control of the plan. In effect, the proposal as it stands would put into operation in North Dakota local medical care plans similar to those existing in other states. The actual operation of the plan is pending its acceptance by the physicians of the state.

In South Dakota, a district plan is being set up on a trial basis at Pierre. This unit will provide medical care for Farm Security Administration families in the several counties in that area. There is a potential case load in this area of approximately 2,500 families or 12,500 persons, with 13 physicians, 8 dentists, and 2 hospitals. Funds will be loaned to these families for participation on the basis of $33 a year per family, which will provide emergency medical and dental care, hospitalization and prescribed drugs.

The unit was set up in order to test the legality of a ruling recently issued in South Dakota. At a recent session of the South Dakota legislature, a Bill was enacted which purports to require that all practitioners of the healing art participate in any public health and medical care program that is conducted in South Dakota. The Bill might compel the South Dakota Farmers' Aid Corporation to utilize the services of osteopaths, chiropractors, and other similar practitioners, and thus alienate the medical profession from the program. The Attorney General of South Dakota has given a written opinion to the effect that this Act of the Legislature applies only to funds appropriated by the State of South Dakota. The matter cannot be finally decided until it is passed upon by the proper courts.

In order to pave the way for such action, the single medical care unit was set up at Pierre. Should the osteopaths and chiropractors wish to make a test case of the matter, they may proceed to get out an injunction and the matter would be given final determination by the courts. No further units will be established in South Dakota until this legal question has been settled. The decision will affect approximately 22,000 families in South Dakota who are receiving aid from the Farm Security Administration.

In California and Arizona, a different type of medical care program was undertaken, to meet the needs of migratory agricultural workers who required medical attention, but rarely could afford to pay for such aid.

The influx of migrants into California and Arizona since 1935 has created a serious public health problem in these two states. Most of them have a low and uncertain income, live in roadside "jungles," patched tents or hastily improvised shelters with no sanitary facilities.

The constant movement of migrants from one farming area to another, sometimes more than 300 miles away, contributed to the rapid spread of communicable diseases. Despite the vigilance of the California State Department of Health, outbreaks of smallpox or typhoid in widely separated counties remained a potential threat.

In May, 1938, the Farm Security Administration, with the coöperation of the California Medical Association, the State Department of Health, and the State Relief Administration, formed the Agricultural Workers' Health and Medi-

cal Association, incorporated under state laws. Each of the agencies has a representative on the Board of Directors of this non-profit corporation.

Migrants make applications for medical treatment at the association's district offices or camp treatment centers. A certificate of membership in the health association, which serves as an identification card, is issued to the applicant.

He then selects his physician from a list of participating physicians or is treated by the local part-time physician in charge of the treatment center. The Agricultural Workers' Health and Medical Association is billed for the medical services or hospital services rendered. In many treatment centers, local physicians work in the clinics at designated hours on alternate days. The personnel of the typical treatment centers consists of a part-time physician, a nurse, and a clerk. Services include ordinary medical and surgical care, laboratory examinations, x-ray, dentistry, prescriptions, and treatment as required.

Although the migrant workers are obligated to repay the cost of services "if so requested" their economic status precludes any expectation of repayments in most cases. Some workers, however, have been able to repay a few dollars. In view of the savings effected in the health of the two states under this program, it seems probable that adequate financial support will continue. Similar conditions prevailed in Arizona, and similar measures were undertaken.

There are, at present, 13 medical care centers in California and 6 in Arizona.

DIFFICULTIES ENCOUNTERED

Appraisal of the medical care program is difficult. There are many pitfalls that have been avoided and yet there are bound to be difficulties in a program which affects so many people in widely diverse areas. The human element cannot be overlooked. No matter how perfect a plan is theoretically, when put into practice it must deal with actualities. There has been a certain amount of abuse of the program by both the physicians and the families. Physicians sometimes present bills for previous services to these families; submit bills for families not on the program; or charge a higher fee for rehabilitation borrowers than for other patients on the same economic level. Families sometimes use a number of physicians during the month; request service for chronic ailments, or request unnecessary services. These difficulties were to be expected and mechanisms are being developed to control them.

Each participating physician gets a list of participating Farm Security families in his county and each family on the program gets a list of coöperating physicians. The health participation agreement which the family signs sets forth the medical benefits to which they are entitled. Physicians keep individual records of each family visited. In some areas participating families make monthly reports on health services they receive. In addition to this, a reviewing committee, drawn from the physicians' ranks, is set up under each plan to go over bills. This committee can adjust bills when necessary. A strong reviewing committee limits abuses by the physicians. The county supervisor acts in a like capacity for the families, checking on the number of unusual demands for services made by families. Usually, if the family is abusing the program the matter can be adjusted satisfactorily, otherwise the family is dropped from the program.

The attitude of both the physicians and families toward the medical care program is, on the whole, favorable. Monthly payments to physicians have ranged from 40 to 100 per cent. Payments under the plans average, the country over, approximately 60 per cent of total bills presented. One physician remarked that he was glad to get that

much of his collections, since in other cases he had not collected so much. From another county in a southern state comes the report, "The doctors would like 100 per cent payment, but they admit that 74 per cent is better payment than they usually collect from their rural practice. Some doctors have admitted that they were opposed to the project until they served on reviewing committees or otherwise saw more of the aim of the program."

The heart of the program lies in a clear understanding on the part of physicians and families as to what can be expected under the program, and its limitations. It is essentially a special program for an under-privileged group of farm people. The plan could not be transferred to any other segment of the population without some change. A more solvent group of people would demand an extended and fuller program of medical care. But for the group of people for whom the program is giving new opportunities and aid in efforts to get back on their feet, the plan is a boon. Due to the impossibility of isolating the results of the medical care program from concurrent Farm Security Administration programs of diet improvement, environmental sanitation, and better housing, it is impossible to state statistically the results of the medical plan in terms of generally improved health.

In the final analysis, the fact that 99 per cent of the medical plans in operation last year are continuing to operate is a telling point, since the whole basis of the medical care plans is *voluntary* cooperation from families and physicians.

New Developments in Underground Drainage for Malaria Control*

THOMAS A. RANDLE

District Supervisor of Malaria Control, WPA Malaria Control Program in Mississippi, Tupelo, Miss.

UNDERGROUND drainage for malaria control was used by LePrince and Gorgas in Panama more than thirty years ago. These systems were constructed of tile laid in narrow contour trenches and covered with broken stone. The trenches were completely filled with the broken stone so that some of the surface water would be carried by these ditches. Large stone was placed in the bottom, and smaller stone was placed in the top layer at the ground surface. The excavation was placed on the downhill side of the trench to prevent the impervious material from being carried by the surface water into the voids between the stone, which would destroy the usefulness of the system. The system of underground drainage has proved to be an effective method for permanently eliminating Anopheles breeding areas caused by seepage. Its usage as a malaria control factor is gaining widespread recognition.

Under the malaria control program in Mississippi, underground drains have been constructed using poles, gravel, rock, brickbats, and even tin cans, as well as tile. Experience has proved that "blind ditches," or underground drains, for farm drainage, when properly constructed of poles, will give satisfactory service for a number of years with no maintenance whatsoever. Some farmers have reported that they know of systems that have been installed for over fifty years and are as satisfactory today as when constructed. Poles when placed underground and submerged in water will last indefinitely. Logs buried under 5 and 6 ft. of dirt for indefinite periods have been found to be sound and in good condition. Underground drains constructed of poles 4 years ago are giving satisfactory service today, and should continue to do so for years to come, as they show no sign of failure.

CAUSE OF SEEPAGE

When rock, hard-pan, or other impervious material underlies the surface soil, the ground water, not being able to penetrate it, follows downhill on its upper surface, and where the impervious stratum comes to the surface of the ground, or close to it, there may be a source of water. When small quantities of water appear in this way on the ground surface they are called "seepage outcrops." The line of seepage outcrop may be relatively short or may extend along the entire toe of slope of a hill and become the source of a marsh or swampy area.

Marshes caused by seepage are in most cases permanent, and provide excellent breeding places for the Ano-

* Read before the Southern Branch American Public Health Association at its Eighth Annual Meeting in Memphis, Tenn., November 21, 1939.

pheles mosquito. Breeding areas formed by seepage are generally small, but in some instances ponds and marshes have been formed covering several acres. These areas provide excellent breeding places because the water is fresh and there is an abundance of vegetation to provide food for and protection to the larvae. In the hill section of Mississippi such breeding places are very common. Permanent swamps and marshes so formed, located near towns and centers of population, have been responsible for the production of an abundant supply of the only vector of malaria, Madam Anopheles.

Underground drainage is one of the most effective methods of permanent drainage for malaria control, as it requires no maintenance when properly constructed, and it is not expensive to install.

It is most important that the design of an underground drainage system for the elimination of seepage areas be properly planned and executed. In general, a deep, narrow trench is constructed just above the toe of slope of the hill, and this trench usually follows a contour. The depth of the trench will be determined by the elevation of the seepage stratum and by the elevation of the outlet ditch and, where possible, should be at least 3 ft. deep. This type of drainage must be executed by an engineer familiar with this work, as the conventional design for land drainage will not be effective. Where the seepage outcrop extends well up on the side of a steep slope, it may be necessary to construct a series of parallel contour ditches only a few feet apart along the side of the hill. The line of the drain should be as straight as possible, but when changes occur, tangents should be connected by regular curves. Laterals should enter the main drain at an acute angle.

Narrow trenches, usually from 1 to 2 ft. in width, will be sufficient for all systems. Generally, it is best not to have the trench longer than 500 or 600 ft. If great care is taken in the construction of the individual ditches in the system, there is no great objection to making the ditches somewhat longer. However, with the average inexperienced crew, I would not recommend long underground drains. The grade on drains consisting of material other than tile should not exceed 2 ft. per 100 ft. Grades of 0.20 to 0.50 ft. per 100 ft. will tend to make the system more permanent since none of the soil will be lost by erosion. A profile of the system is made in order to lay a grade suitable to the topography.

The material: poles, rock, gravel, brickbats, tin cans, stone, or other suitable material, should be placed to a depth of from 1 to 1½ ft. in the trenches and covered with straw, grass, leaves, or brush to a depth of approximately 6 in. after being thoroughly compacted. The trench is backfilled to a height of about 1 ft. above the original ground level. Much care must be taken in placing the material in the trenches so that voids will be left for the water to run through. The straw, grass, or leaves placed in the trench acts as a filter and prevents sand or soil from filling the voids. If the soil is very sandy the filter should extend down around the drain. The dirt should be tamped in the backfill to make it as watertight as possible. If poles are used as the material in the drain, the joints should not coincide. Experience has proved that failure always occurs in the filter when two or more joints are placed together. The placing of material should begin at the upper end of the ditch so that the chips, debris, or flotage will be washed away rather than into the finished drain.

The outfall should be protected by building headwalls of brick and mortar, concrete, or rock. Two joints of tile should be used in the drain at the head-

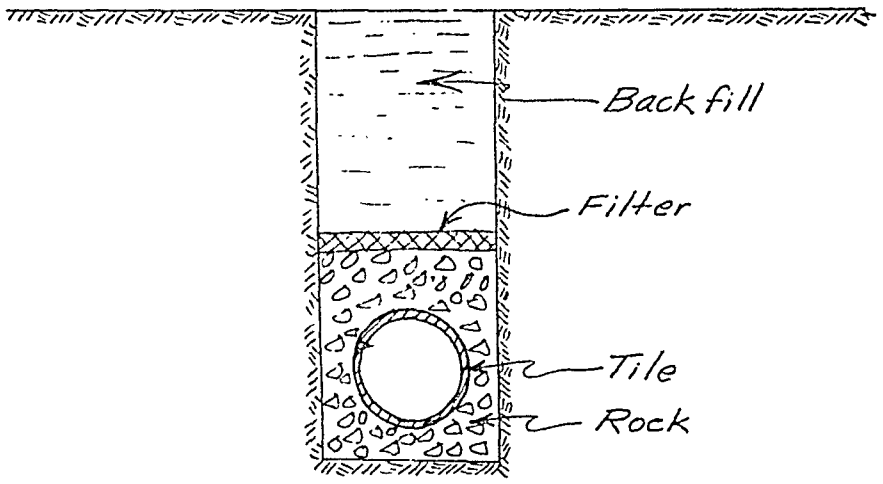


FIGURE 1—French drain using tile set in stone

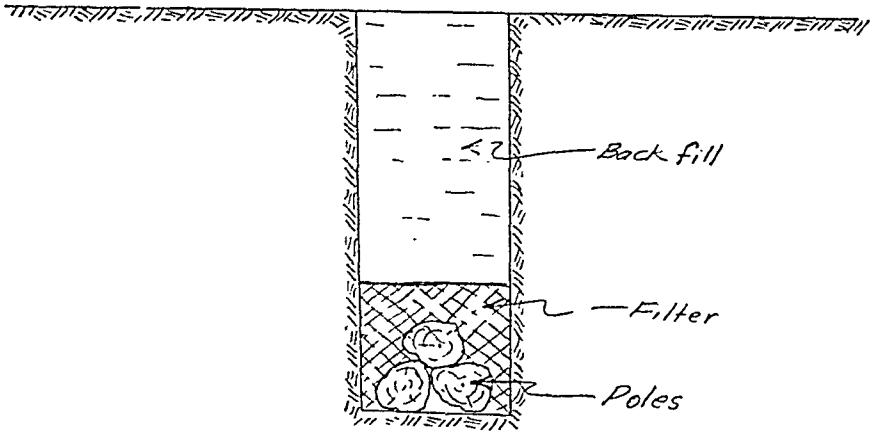


FIGURE 2—French drain using poles

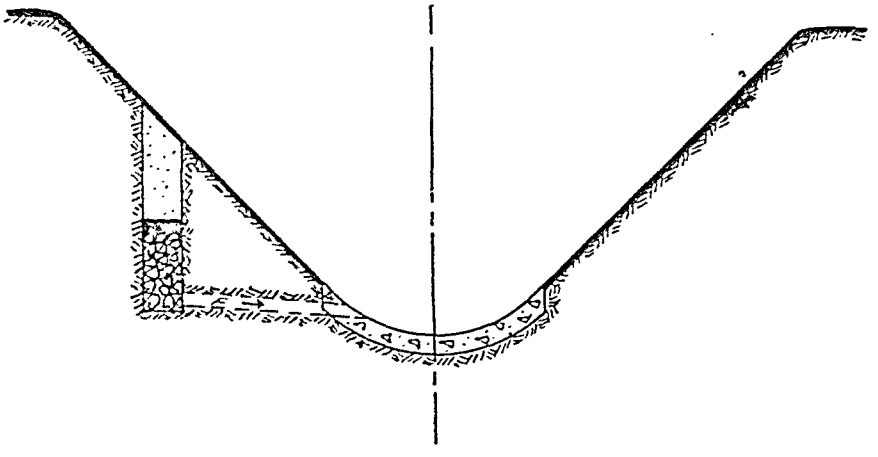


FIGURE 3—Stabilizing of ditch banks

wall to protect the material. Poles deteriorate very rapidly if exposed to the air, and may thereby cause a failure of the whole system.

Uses of underground drainage for malaria control other than intercepting seepage outcrops are: sub-draining open earth ditches, concrete inverts; stabilizing ditch banks; draining marshes caused by springs; and providing outlets for overflowing drinking fountains.

The construction methods for these other uses for underground drainage are about the same as for interception of seepage outcrop. Of course, the location of the drain will vary for the different uses.

Figure 1 shows a French drain, using tile set in stone, Figure 2 a French drain, using poles, and Figure 3 stabilizing of ditch banks.

If the banks of the ditch are filled with seepage and tend to cave in or are hard to hold in place, they can be stabilized by using a small underground drain as shown. A narrow drain is dug perpendicular to the seepage outcrop to a depth sufficient to intercept the flow or to a depth which will permit drainage into the outlet ditch. This drain may be placed in the slope of the bank as shown, or it may be several feet from the edge. The trench should be filled with any suitable material as has already been explained, the filter placed, and the backfill made as in any underground drainage ditch. A joint of small tile is used to carry the seepage water from the drain into the ditch, and should enter the side of the invert 3 or 4 in. above grade. The tile always enters the invert at an acute angle.

Figure 4 shows sub-draining of open earth ditches and inverts. If a great amount of seepage water is encountered which seems to prohibit the construction of an invert in the ditch, the difficulty may be removed by sub-draining the invert to lower the water table as shown in the diagram. The drain is constructed directly under the invert and should be from 1 to 1½ ft. in depth. If the grade of the ditch is sufficient to allow the construction of spillways, the underground drains can be made shorter and their effectiveness

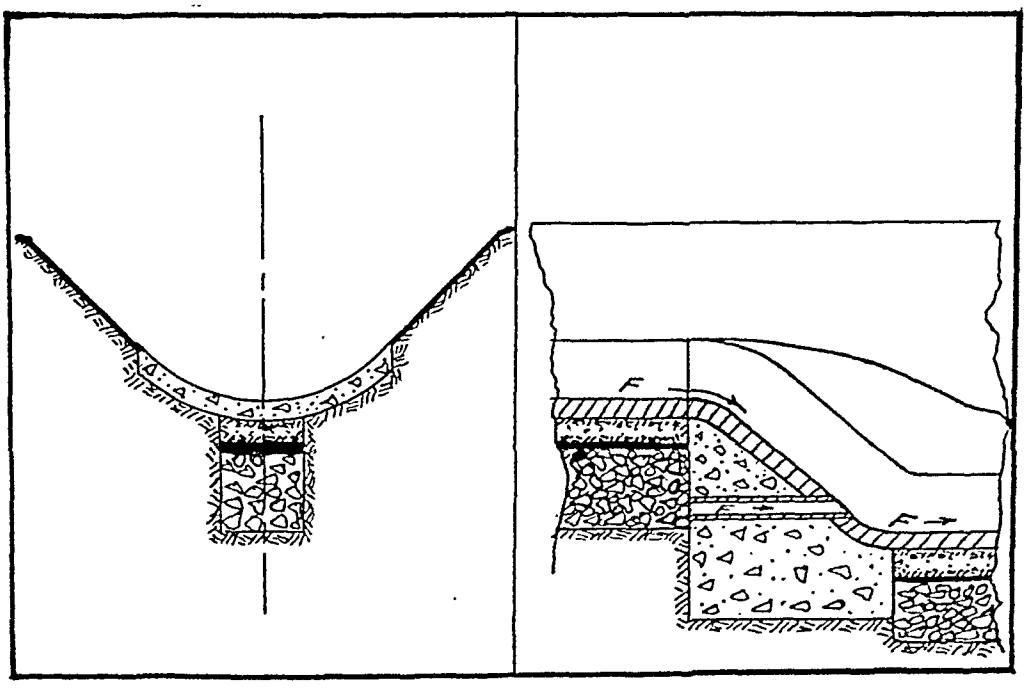


FIGURE 4—Sub-draining of open ditches and inverts

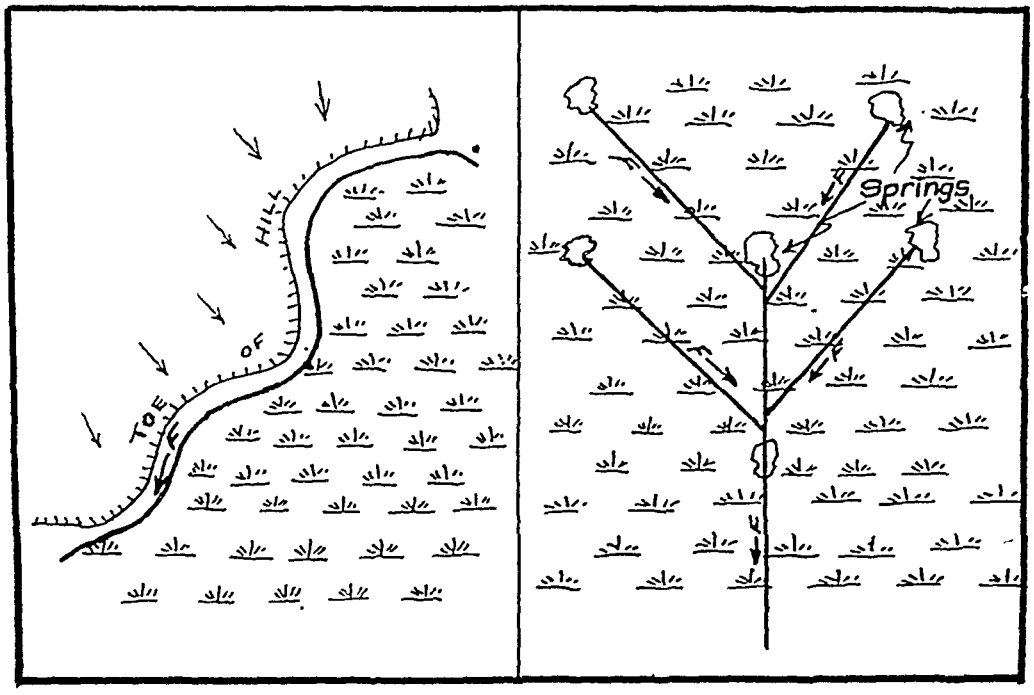


FIGURE 5—Drainage of marshes fed by springs

increased. On ditches having a steep grade, the spillway will serve two purposes; namely, decreasing the grade of the main ditch and making possible the construction of short underground drains.

The sub-draining on open earth ditches will eliminate water standing in potholes and behind small obstructions. It is also best to provide spillways on open earth ditches having very steep grades to prevent erosion. They should be constructed of brick and mortar, concrete, masonry, or rock. It is not advisable to use regular curves to break the grade at the spillways as on invert ditches, but to use abrupt drops of about ½ ft., making the spillway similar to *stair steps*. These abrupt drops will tend to decrease the velocity of the water so that the erosion on the ditch bottom will be decreased. The banks at spillways must be riprapped.

Figure 5 shows drainage of marshes fed by springs. Springs causing marshes and swamps may be irregularly located with reference to contours, and for this reason cannot be eliminated by the regular contour trench. To eliminate the swamps, a system of underground drains is provided, consisting of the main ditch and a separate lateral for each spring, as shown in the diagram. The laterals should enter the main ditch at an acute angle, and laterals on either side should not enter at the same point but should be staggered. The diagram on the left shows the general location of a contour ditch with reference to the flow of seepage water.

COSTS OF CONSTRUCTION

A WPA malaria control crew in Tishomingo County, Miss., was used in constructing the underground drainage system to intercept seepage outcrops, from which costs were determined (see Table 1).

This ditch was 2 ft. wide and 3 ft. deep. WPA rates per hour for labor in Tishomingo County at this time were: unskilled $.27 and skilled $.42. The material consisted of poles. They were placed to a depth of approximately 1 ft. in the trench. Roughly, 1½ cords were used. The poles are valued at $2

TABLE 1

Detail Cost of Underground Drain per 100 Feet

	Unskilled		*Skilled*		
	Man Hrs.	*Cost*	*Man Hrs.*	*Cost*	*Total Cost*
Excavation: 22 cu. yds.	46.29	$12.50	5.66	$2.38	$14.88
Cutting poles and brush	5.07	1.37	0.62	0.26	1.63
Placing poles and filter	17.49	4.72	2.17	0.91	5.63
Backfilling	14.67	3.96	1.79	0.75	4.71
Total	83.52	$22.55	10.24	$4.30	$26.85

per cord. Therefore, the cost of material for 100 ft. of completed ditch was $3. The total cost for labor and material was $29.85 per 100 ft. of underground drain completed.

Figure 6 shows the conditions that existed before drainage at Jackson, Miss. Note the water standing in the entire length of the ditch. This water was permanent and provided an excellent breeding area for the Anopheles mosquito. This seepage was caused by an overflowing drinking fountain in Battlefield Park in Jackson, Miss.

Figure 7 shows the project at Battlefield Park after completion.

ADVANTAGES OF UNDERGROUND DRAINAGE SYSTEMS OVER OPEN DITCHES

The following are good points in favor of underground drainage:

1. Low cost of materials.
2. Low cost of construction. (Costly supervision not necessary.)
3. Low cost of maintenance.
4. More permanent.
5. No land lost for right-of-way, since cultivation can be extended over the drain.
6. Can be used where other types of drainage are impossible.

Since the ultimate cost of the drainage system for malaria control is the one important thing that concerns the sponsors, cheap, effective systems are



FIGURE 6—Conditions in Jackson, Miss., before drainage



FIGURE 7—Conditions in Jackson, Miss., after drainage

sought. It is nearly always possible to obtain cheap material locally for underground drains: suitable material that the sponsor can purchase at a very low cost. This, in connection with WPA labor, will guarantee a worth while project in poor communities where the cost of expensive drainage systems would be prohibitive.

Once the marsh or swamp is drained, the land owner will, in most cases, immediately begin to put the land in cultivation. This one common interest, if no other, will be sufficient to insure that the system will be properly maintained.

We know that all malaria control drainage systems cannot be underground systems, but we also know that they can be employed and effectively used in a greater number of ways than ever thought possible a few years ago. A few of these new uses have been presented, and I am certain that we all look forward to developing even more ways in which to use this valuable, economical, and permanent method of drainage where conditions indicate its feasibility.

American Defense in Terms of Public Health

TO lift from our people the load of preventable disease, to insure adequate nutrition of the masses, to free our nations from the large and unseen tax for the care of the unfit, to provide opportunities for healthful living, may in the long run be more important as a means of defense than are instruments of war. These objectives are of equal importance for the peaceful progress of our nations.—Dr. Thomas Parran, address at the Opening Session of the Fourth Pan-American Conference of National Directors of Health, May 1, 1940.

Training for Public Health—A Review and a Forecast*

E. R. COFFEY, M.D., F.A.P.H.A.
Surgeon, U. S. Public Health Service, Washington, D. C.

THE title assigned to me promises a review and a forecast of public health training. For the first part of the title, the review of public health training, I shall go back no farther than the enactment of the Social Security Act in 1935. By providing funds for the extension of public health activities, this Act gave a decided impetus to the whole public health movement, not only in its actual practices, but in the general concept of its meaning and responsibility.

In adapting their agencies to this expansion, administrators were forced at once to cope with a dearth of persons adequately trained for public health work. Even though they consistently tried to select those with the highest degree of training, they often had to accept workers with neither academic nor practical initiation into the principles and practices of public health. Some of these public health workers, to use a good colloquialism, "just didn't know what public health was all about."

Fortunately, while the Act provided for training of personnel, wisely enough no specifications were set up as to the manner in which they should be educated. Administrators were left free to develop what they considered suitable programs of training, and the training funds were used in a variety of ways. Stipends were allotted to individual workers for a year's training in a recognized school of public health. Short-term courses were planned by many of these schools either as a part of the regular courses or as a condensed presentation of the more salient points in the complete curriculum. In-service training courses were inaugurated. Some of these were exceedingly well planned programs and others ranged down through more or less well constituted plans to single demonstrations which made their brief appearance and vanished. A frequent type of in-service training was the occasional discussion group, called together as problems arose, and valuable in proportion to the reality of the problem and the insight, experience, and enthusiasm brought to bear upon it. Traveling fellowships were also provided and tuition was paid for students who were to take care of their other expenses. Several states organized their own field training centers.

All these methods have had a considerable vogue and all can be credited with helping to improve the quality of the public health staffs, though the results of each method will vary between groups of personnel, between agencies, and between states. At any rate, all have undoubtedly helped to raise the level of training, and we have statistical evidence to show that this

* Read at a General Session on Professional Education of the American Public Health Association at the Sixty-eighth Annual Meeting in Pittsburgh, Pa., October 18, 1939.

level of training has risen with the use of Social Security funds. Some measure of this improvement was given you in the paper on "Educational Qualifications of Staff Members in Health Departments," presented at another session of this meeting.[1] A tabulation comparing qualifications of public health workers appointed within the past three years with those employed prior to that time shows that the "newer" personnel on the whole possess a higher degree of training for their work.

Even with this improvement, the data from this study of qualifications reveal, as was pointed out in the previous paper, a great lack of specific public health training among those now at work in the field. Of the 14,000 physicians, nurses, and sanitarians represented in the study, approximately 907 physicians, 2,890 nurses, and 3,081 sanitarians have had no academic training at all in the special technics of their profession. Another 4,942 of this group of 14,000 have had no more than the brief sort of field training obtainable in a special orientation course of some 2 weeks' to 3 months' duration.

Thus, even though a great effort has been made during the past few years to provide training for workers, and even though decided progress along that line can be claimed and proved statistically, health administrators still have a long distance to go before it can be said that the field at last is staffed with well qualified and adequately trained workers.

What we can do, however, at this stage is to take time out and define our aims. Our concern must be not what we can do, but rather what we should do. In other words, what should be the responsibilities of the schools of public health, and to what extent should health administrators feel obliged to provide training for their personnel? These are large questions to which I cannot presume to give final answers; the most that any speaker can do right now is to bring them up for discussion.

It is reasonable to assume that 85 to 90 per cent of a public health worker's technical knowledge should be secured in his basic professional school, and that public health schools should not be expected to supply anything except specific public health training which should constitute about 15 per cent of his technical equipment.

A student may major in history and come out of college with his mind full of the wars, crusades, reforms, revolutions, and what-not that men have waged for, lo, these many centuries. But he is not a teacher unless he has the skill to transfer all this to a roomful of young minds so that they may gain some comprehension of the pageant of mankind upon this planet.

So it is with the doctors, nurses, and sanitarians who seek a career in the field of public health. Their public health training grooms them for that particular field. It initiates them mentally and professionally into the carrying on of large-scale health activities. It teaches them to adapt their knowledge and technics to the community—the community both as an environment and as a population. It leads them to think in terms of many people, the sick, the well, the disabled, and the mildly ailing, for all of whom public health carries on programs of protection and instruction.

There are many who assume that any doctor or nurse can be a public health worker; that becoming one involves no change or orientation; in fact, nothing more than declaring one's intention and securing a job. They will argue that public health work is no more than the intelligent use on a broader scale of fundamental knowledge. Educators complain that we regard health education simply as a camp follower of other knowledge; that the basic information is all that is necessary, and with it

under his belt the worker can step bravely forward toward one of the most important objectives of the field—education of the public in the ways of health. These educators doubt that a great movement like public health can become thoroughly educational without having its workers skilled in the technic of educating.

While I am on the subject, let me bring in one nearer to my own experience—administrative technic. This is particularly needed by those responsible for administering the programs—the health officers, bureau directors, supervisors, and so on.

By administrative technic I mean more than dictating a report or signing official documents. A trained administrator will take pleasure in formulating an original and rational program to fit the special needs of his community; an untrained administrator will use a sample program from a book and try to make the community fit it. The capable health administrator becomes in the natural course of his work a leader in the community. The inept (and this in some cases is synonymous with untrained) administrator continues as a not very clearly defined health officer in the public's mind. The good administrator is also a genuine leader to his personnel; he keeps them interested, enthusiastic, keen. The indifferent one may be simply " the boss."

Though some may claim that capable administrators are born, not made, we know that the successful handling of people can be learned under proper instruction. Salesmen are taught to handle other personalities skillfully. So are missionaries, teachers, demonstrators, barkers, ushers, and so on through the whole list of occupations wherein the individual must acquire a skillful approach as a part of his job. Business has recognized for a long time that the better part of success lies in the ability to win the public, and the field of health is now laggardly catching up with this point of view. I have been in many health organizations where I felt that the health officer, trained in a school of public health though he might be, would profit by a course in modern business administration.

A few years ago a similar lack of training existed among teachers and the idea was quite common, both within and without the field, that anybody who knew the subject matter to be taught could be a teacher. This idea was overruled and the weaknesses were overcome after a series of objective studies had been made and the disciplines indicated applied. Very minute job analysis studies were made by experienced observers. They studied the task or problem, the worker, and his method of handling it, and developed suggestions for the types of training and experience that would help such workers in solving similar problems. As a result more practical training courses were instituted through which the students solved problems, engaged in practise teaching, and acquired facility for the specific tasks they would be required to perform when employed. Some such objective studies of health workers and their problems would without doubt yield valuable suggestions in preparing new workers for the field.

So much for the courses of study. Another thing we shall have to decide is whom we shall train. Shall we continue to employ professional people (physicians, nurses, and other scientifically trained workers), and then assume the responsibility of giving them their public health training? In great degree that is what we have done in the past. Shall we continue it in the future?

I think without doubt the answer should be " no." It seems to me we can reasonably ask that our personnel come to us already trained for public health work. For all its comparative youth,

the public health movement has the prestige of an honored institution. The tenure of office for its workers grows increasingly stable. In more and more jurisdictions the salaries offered may be described as substantial. Public health is rapidly becoming a career service, and there is no reason why the new worker should not secure his own basic training. Naturally there will be specific tasks he must learn after he gets on the job, but we expect him to bring his basic training with him.

As I say, it seems to me we are all within our rights in presenting such a front to incoming personnel. But how about existing personnel? What shall be our attitude toward training them? The paper on qualifications to which I have been referring shows that about 22 per cent of the physicians, 12 per cent of the nurses, and 2 per cent of the sanitarians have had at least 1 year of training in a graduate school of public health. This group, to my way of thinking, should be left out of our calculations in the provision of formal training, though by "left out" I do not mean that we should neglect them or shove them aside. Having had a year or more of formal public health training, this group may be considered trained, but we cannot by that token just wave them on their way with the admonition to keep themselves out of a rut. Even though we do not provide formal training, we must see that they have some broadening and stimulating experiences, through in-service training courses, round table group discussions, and the like. It would not be amiss to include an occasional traveling fellowship to give a worker experience in a particular line.

The large number of personnel without specific training in public health offers a more difficult problem, and along with our responsibility for carrying on public health activities goes the responsibility of training workers so that these activities may be properly conducted. Among the 14,000 whose qualifications have been discussed before you, about 6,800, or some 48 per cent, report no specific public health training. Since we cannot consider providing a full year's training for so large a number, we must select, by such criteria as appear to us wise, those who are to receive training. The State and Territorial Health Officers have set up certain minimum educational requirements which trainees must possess. Some states have gone no farther than these minimum requirements in selecting persons for training, but other states have consistently chosen only those persons whose educational backgrounds are considerably more complete than the minimum requirements demand.

The wide variance of the different state training programs is well illustrated by a study of 1,938 trainee questionnaires from half a dozen selected states.

In 5 of the 6 states examined, over 90 per cent of the sanitarian trainees had had some education beyond the minimum high school requirement. Moreover, 60 per cent had received a college degree, two-thirds of whom held their degrees in the fields of science or engineering. In contrast to this, the 6th state chose only 55 per cent of its sanitarian trainees from persons with college training, not one of whom held a college degree.

The same sort of variation, only more pronounced, is evident in the selection of nurses. One state reported that 80 per cent of its nursing trainees had had some previous college education. Another state showed barely 8 per cent of its candidates with such training. In the first state 20 per cent of those awarded training held their college degree, and in the second state the per cent was only 3.

Certainly one of the criteria for selection of trainees should be a thorough

educational background, which in itself is some indication of an aptitude for acquiring new knowledge and technics.

A second criterion might well be: How many years of service does the prospective trainee have before him? In other words, how old is he? Not all the states have consistently applied this criterion in selecting their candidates. The method varies from state to state. Several states in which the training programs were studied are making a definite effort to select the younger physicians for training. In two states all of the health officer trainees with no previous public health experience were under 35. The majority of them were under 30.

In another state, 40 per cent of the physicians trained were past 35 years, and two-thirds of them had had no previous experience whatever in public health. Still another state sent 2 doctors away to receive health officer training, one of whom was past 50 and the other past 55. Both had had about 30 years of private practice and no previous public health training or experience.

It is true that one has to be cautious in making selections based solely on age. If we choose our trainees by the extremely practical consideration of what may be expected from them in return for their training, the chances are we shall select the larger number from the younger people. On the other hand, in the older groups we have those many workers who have profited richly from their experience, the type who continue to extract learning from every situation they meet; persons of insight who would bring back from a trip on a traveling fellowship a wealth of ideas for their own jobs; persons of judgment, of skill, of clinical experience, of wisdom and tact, who should have the chance to catch up on the new knowledge in their profession. There is no measurement of the returns they will make from a chance at gaining more training and experience.

One thing to bear in mind when selecting trainees is whether it is either wise or proper to use tax funds to train individuals for a career in public health who already have spent their most productive years in other fields.

As to personnel who have spent years in the field and still remain comparatively untrained, we must provide in-service "refresher" courses and all other means possible to raise the quality of their work until such time as they leave the field or retire.

Signs of the times foretell for the future a broadening program of public health. They show an increasing need for specialists as the programs take on special responsibilities. There is increasing evidence that public health will have to assume responsibilities for administration of programs on medical care, including operation of hospitals, clinics, and various other schemes of medical service. The public health movement, in the new aims for the eradication of disease set for itself, will need not only consultants skilled in the control of cancer, pneumonia, syphilis, and the degenerative diseases, but men who know the administrative end of such work. It is difficult for specialists to strike the right balance between training in their specialty and training in administration and public health. But it must be done if the specialist is to be able to see the job in its entirety and not just in part.

One other administrative problem must be solved if the funds spent for training are to serve their purpose. Such training is intended to produce additional services and better services in public health. It should go without saying that a person accepting training is figuratively giving a promissory note for services to be rendered in return. In other words, he will return to the

field and work. The turnover among personnel who have received public health training at public expense, however, is great enough to suggest that perhaps there should be a written understanding with regard to the responsibilities of the trainees.

From February, 1936, to the close of the fiscal year of 1939, approximately 5,000 persons had received training financed in whole or in part by Social Security funds. The progress to be expected from such an amount of training is considerably diluted by the number of those who did not return to the field of public health work, or returned only for a short time and then left.

In conclusion, it may appear that this paper has done nothing but raise items for consideration—but that is just the point, these items well considered will be our guide to future policies. We cannot carry on activities that will dovetail into an excellent nation-wide training program until we have learned the answers to questions that bob up the minute we undertake to provide training for personnel—answers to such questions as: What do we mean by public health training? Whose is the responsibility for giving it? Whom shall we train? By what criteria shall we make our selection?

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Supervision of Public Health Nurses A Continuous Educational Program

From the Point of View of the Rural Agency*

ANNA HEISLER, R.N., F.A.P.H.A.
Regional Public Health Nursing Consultant, U. S. Public Health Service, San Francisco, Calif.

RECENTLY the writer was called upon to appear before the Board of Health of one of the western states in defense of supervision of public health nursing. The defender felt inadequate in the presence of a mixed board consisting of a lawyer, four medical practitioners, a druggist, a dentist, and an osteopathic physician, who were from the outset opposed to expenditures upon personnel who were obviously not direct distributors of service to the consumers. According to their line of thought, the salaries expended for supervision could much better be spent for medical service and direct nursing care for the indigent. All answers to the arguments presented by the spokesmen of this board seemed to fall flat and to have no meaning for the "doubting Thomases" composing the board. Even an analogy between nurse supervision in a hospital and nurse supervision in the public health nursing field was rejected as worthless.

The situation which confronts the speaker today in facing an audience composed perhaps entirely of public health nurses—supervised and supervising—is almost diametrically opposed to the situation first described. You are already convinced of the various values of supervision. Among public health nursing groups supervision has for so many years been taken for granted that any attempt to defend it here would seem unnecessary. It might, however, be appropriate to quote Dr. Parran's justification for general public health supervision which he presented in his address to the public health nurses at the American Public Health Association meeting in New York in 1937:

> Without able administrators and executors of sound public health policy, without a considerable addition to the ranks of those who can both interpret and create, without adding year by year to the ranks of those qualified for leadership, I see the probability of a levelling out in public health accomplishment.[1]

The purpose of this paper, as suggested in the title, will be merely to summarize some of the educational phases of supervision, with specific reference to rural programs. The examples cited will be taken from the western states, since they comprise the area most familiar to the speaker.

The word "continuous" in the title implies a continuing from the beginning that has already been made in basic nursing education, and in public health nursing education. This is particularly true in the West where almost all who enter upon rural public health nursing

* Read before the Public Health Nursing Section of the American Public Health Association at the Sixty-eighth Annual Meeting in Pittsburgh, Pa., October 20, 1939.

have had some theoretical instruction in public health nursing, and many have had at least a year of university study with a major in public health nursing. It can be seen, therefore, that the province of supervision in the western states is one of assisting the staff nurse in the application of general principles which she has already learned more or less theoretically at the university. But, to quote again from Dr. Parran's 1937 address:

> It takes more to make a good public health nurse than an R.N., some years of nursing, and a public health nursing course in one of the schools which offer sound postgraduate courses. When we have learned the intangible what and why which separates the efficient from the futile, among those with similar technical backgrounds, we shall have learned the basic lesson in personnel management—or vocational adjustment, call it what you will—which needs to be learned promptly.[1]

The public health nurse recognizes her need for more than an R.N. and a public health nursing course, and therefore she not only expects and accepts supervision, but in the rural area she welcomes the supervisor as a teacher who is able and willing to help her find the answers to her specific problems. It is interesting to note that the better prepared the nurse is, the more analytical of her own needs she becomes, and, consequently, the more articulate she is in requesting specific assistance; usually, too, the better work the nurse is doing, the more eager she is for supervisory help.

We are all agreed at the outset, no doubt, that among the functions of public nursing supervision, three are of great importance: (1) the improvement of public health nursing service, both in quality and quantity; (2) the improvement of the worker; (3) the arousing of a greater demand for service, as an outcome of better community understanding and appreciation of the service.

The improvement of the service depends so much upon the improvement of the worker, and the two are so intimately linked together, that the inclusion of both will be implied in the discussion that follows.

How can the rural supervisor assist in the improvement of the nursing service and in the improvement of the nurse herself? She may begin with the introduction of the new nurse to the field, either through a group conference or an individual conference with the new nurse. The length of this introductory period varies in the states of the western district from 2 or 3 days to 3 months. The 3 day period in one state covers a bird's-eye view of the state health department, an explanation of the relationships of the division of nursing to other divisions, a brief introduction to the nursing manual, a glimpse at the record and report forms, and at the list of state health and welfare agencies. She is also expected to read reports from the county to which she is assigned, and to note the names of local community leaders.

In another state, the introduction to the field may consist of 3 months of carefully planned experience in a well organized local health department. The new nurse coming into this situation will have had at least 1 year of public health nursing study in a university offering an approved curriculum; and in most instances she will have had the field work required by the university. She may have had also public health nursing experience in another state. The purpose of this type of introduction is to orient the nurse to an entirely new environment; namely, a Spanish-speaking population, with a background of racial and family customs, superstition, and dietary habits that are totally new to the public health nurse. Additional difficulties are the great distances over treacherous roads through sparsely settled areas, uncertain weather conditions, and absence of telephone communica-

tion. It is felt in this state that the new nurse can learn to cope with these various factors only through a rather long period of guidance in an environment similar to the one she will find in her own county.

In a few instances, the supervisor, by way of introducing the new nurse to the field, accompanies her to the county and remains with her for a few days during the orientation period; or she may visit the new nurse soon after her arrival at her new post. On later visits the supervisor may give individual assistance through office conferences, or visits with the nurse in the field, through answers to specific questions, or through guidance in reading or in selection of further courses. From the office the supervisor may help through letters, or through library facilities which some states make available to field personnel.

Two of the western states issue a monthly public health nursing bulletin; one state buys space in the monthly journal published by the state nurses' association; another state is invited to contribute to the monthly journal of the state nurses' association; the nursing division in several states contributes to the bulletin published by the state department of public health.

One state uses the public health nursing bulletin as a very definite educational tool. Each issue contains at least one article on subject matter that public health nurses are expected to know; some reference material; notations on procedures, technics, standards or policies that need to be emphasized or modified; occasionally a book review; and frequently suggestions regarding community organization. In the instance of this state, some of the material in the monthly bulletin is designed to pave the way for the next educational conference.

Another way in which a state supervisor may help the rural nurses to improve their services is through group education plans. In all of the western states and, no doubt, in most of the states throughout the country, the state supervisory staff takes the initiative in formulating plans for staff education conferences. If the conference involves nursing personnel from several counties, the conference is usually planned for one day and in some instances for two days, rarely for a longer period.

One state in the West has effected plans in coöperation with the state university for conducting extension courses in three or four centers throughout the college year, by means of which all public health nurses may have the opportunity to continue their university study in fields related to public health, with or without credit.

Staff education conferences have given an admirable opportunity for democratic sharing of responsibility. For instance, in one state, the initial step in preparation for the conferences was a letter sent to the various public health nursing agencies and to nurses working alone, requesting that they select from the list of proposed subjects for the quarterly conferences their first, second, third, and fourth choices, and to add any other topics which they might choose. The selection of topics for the year's discussions was based upon the nurses' expressed preferences. They were asked to choose also whether they would have a group luncheon on the day of the conference. The district units of the State Organization for Public Health Nursing were requested to make arrangements for the several places of meeting and for a person to register those in attendance. One of the local nurses was asked to preside at the meeting in her district; others were requested to present case studies.

Similar democratic participation in planning is found in most western states. In one state, the nurses themselves decide upon the frequency of staff meetings, their duration, and the centers at

which they shall be held, as well as the method of conducting the conferences.

Democratic sharing of responsibility in one state is evidenced by the appointment of a committee of staff nurses to set up the form for the evaluation of the staff nurse's work. In many instances, the staff nurses are encouraged to evaluate their own work; and it is usual for the supervising nurse to discuss her evaluation of the staff nurse's work with the nurse, in the interest of stimulating improvement and encouraging progress.

The educational content of the supervisory program will center around several broad needs of the nurse. In the first place, the nurse may need help in outlining her objectives and formulating a program to fit the community she is serving. How shall she select from the multiplicity of possible objectives and activities the specific objectives and particular services that will bring the most far-reaching benefits to that community? The supervisor can help her first in analyzing the needs upon which the selection and proportion of services should be based. In some instances, of course, the nurse may have little opportunity for defining objectives and choosing services. The local health officer may be the determining factor in apportioning time and emphasis to various phases of the program; or the directors of various special divisions of the state department of health may heavily influence the choice. In many situations, however, the generalized supervisory nurse, through her own tactful and constructive suggestions regarding the program for the particular health department, can demonstate the value of the nurse's contribution to program planning, as well as to execution of the plan.

In the second place, the supervisor often finds it necessary to stimulate and assist the staff nurses in revising and supplementing their body of knowledge so that their teachings may be scientifically accurate and up-to-date. Since most of the nurses in the western states are engaged in generalized public health nursing, it is necessary that their knowledge of maternity and child care, communicable disease control (including tuberculosis and venereal diseases), and orthopedic nursing be well rounded. Since public health has its roots in the biological sciences, it must constantly expand its body of knowledge to keep pace with the continuous advances resulting from scientific research in these fields. Furthermore, the scope of public health is now being extended to include pneumonia control, cancer prevention, adult hygiene, and certain problems in housing. It would seem safe to predict that the horizon of public health will probably continue to broaden indefinitely.

In addition to program planning ability, and breadth of scientific knowledge, the public health nurse must have the ability to carry out nursing procedures and technics according to the standards set up by the state division of public health nursing. These technics and procedures are usually demonstrated to the new nurses in group conferences and again when changes are necessary from time to time. In one state films have been made to show various technics. The supervisory nurse, after observing the staff nurse's technics in the field or in the clinic, can assist her in eliminating unnecessary motions, in increasing safety, speed, and acceptability of the procedure to the patient; and at the same time, she can help the nurse to gain greater satisfaction from skillful and successful performance of technics.

Another educational opportunity for the supervisor lies in the field of educational methods used in teaching the individual or the family, and in teaching more or less formal groups. Here again

the nurse needs assistance with the modification, adaptation, or application of general principles to the local condition or individual situation with which she is confronted.

Still another area of educational assistance for the supervisor is in the field of community coöperation. Most young nurses need a great deal of guidance in this field. They do not understand the value of lay groups as volunteer assistants or as interpreters of the health work to the community at large. Nor do they know how to make use of such services.

Some of the problems of educational supervision in the West, as already hinted, are related to the vastness and topography of the territory, and the sparsity of population. Whether the staff nurses are to come together for a group conference or the supervisor is to visit the individual nurse in her own field, the time and cost of travel are items of considerable importance. Many of the staff nurses travel from 50 to 200 miles to attend a group conference of one or two days' duration. When mountain driving is involved, as it usually is, a day for travel to the conference and another day for the return trip may be required. Portions of the mountainous territory are isolated for weeks during the deep winter snows, and these posts become inaccessible to the supervisors.

In two of the western states, the area served by the supervising nurse coincides with the area served by the district health officer. Since, under this plan, each supervisor resides in her own district, the distances she has to travel are lessened. But when a state the size of Utah is divided into 5 health districts, the supervisor still has a huge area to cover. Two of these districts embrace more than 18,000 square miles each; in other words, both New Hampshire and Vermont could fit into the area covered by one of these districts. Massachusetts and New Jersey could fit into another district, which covers more than 17,000 square miles. As a matter of fact, Utah could accommodate 10 districts the size of Massachusetts, and still have ample room for Rhode Island.

Other problems related to the difficulty of distance are the infrequency and brief duration of the supervisor's visits. The field nurse may send an urgent request for immediate supervisory assistance; but possibly 4 weeks or even 6 weeks may elapse before the supervisor can visit that nurse. Often the nurse feels that the supervisory visit has been far too short, and that only a few of her problems have been taken up with the supervisor. She is so isolated and has so little opportunity to counsel with an experienced fellow worker that she craves a more generous allotment of the supervisor's time.

Another problem that confronts the supervisors in the western district is that each supervisor has additional responsibilities beyond her general educational functions. For example, she may have many administrative duties; or she may be a special consultant in maternity and child health or in tuberculosis, or educational director for the staff; or she may be all of the supervisors and consultants rolled into one, as well as nurse administrator.

In order to complete the picture of rural supervision in the West, it may be well to add that in some of the county health departments, where the nursing staff is large enough to justify the position of supervisor, there is a resident county supervising nurse. In one state, the county public health nurse who gives leadership to a small staff of nurses is designated as the senior nurse. She has some supervisory responsibilities, but also carries a staff load. This type of county receives the services of a state supervising nurse.

If the objectives of educational super-

vision have been realized, the result should be improvement both in the work and in the worker. Measures of increased efficiency will be: more acceptable and more skillful service and a greater output of work. A growing appreciation of the more efficient service should be evidenced by larger demands for service and a willingness on the part of the community to pay for extended service; and further, perhaps, a willingness of various agencies to coöperate in a plan for generalization of already existing specialized services. Even though the Utopia of generalization cannot everywhere be realized, supervision which has helped to develop a successful local health program and is able to command respect for the organization which provides such supervision, should stimulate other administrators, such as superintendents of schools, to call upon the state supervisory group for assistance in the selection of public health nursing personnel for positions in their agencies.

Improvement in the worker should be marked by increasing capability of self-direction, worth while original contributions, constructive criticism, a willingness to accept change in the interest of betterment, democratic participation both in the formulation and in the execution of plans, evidence of the creator's joy in artistic accomplishment, and the evidence of a desire to excel one's former self.

Educational supervision should lead also to improvement, not only in the nurse's professional proficiency, but also in her social efficiency, adaptability, and happiness. It is extremely gratifying to witness the adaptation of the successful public health nurse to her new environment in the West. Her readily learned loyalty to the local life, its interests, and peculiar charms, and her quick embrace of the prides, joys, and enthusiasms of the people with whom she works are sometimes almost amazing. The supervisor who is able to impart her enthusiasm for and enjoyment and appreciation of the offerings of a particular locality so that she can help the staff nurse in a new environment to identify herself with the people of the community, may consider herself crowned with success.

Such ideal democratic supervision should also promote the development of leaders from the ranks of staff nurses. The West seems to offer a particularly advantageous setting for such development. The well prepared nurse now returning from the university finds that her rural field assignment challenges her resourcefulness to the utmost, affords opportunity for administrative responsibility, and demands the exercise of her full capabilities. The wise supervisor will proudly watch her grow.

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The Federal Cancer Program*

LUDVIG HEKTOEN, M.D.
Executive Director, National Advisory Cancer Council, U. S. Public Health Service, Washington, D. C.

THE character and scope of the federal cancer program are determined by the provisions of the National Cancer Institute Act of August 5, 1937. It seems to me the best way to discuss this program now is to review briefly the steps taken to carry the provisions of the Act into effect.

The purpose of the Act is to provide for and to foster the continuous study of the causes, the prevention, the diagnosis, and the treatment of cancer. For this purpose there is established in the Public Health Service a division which shall be known as the National Cancer Institute. I now quote practically without change section 2 of the Act:

> The Surgeon General of the Public Health Service is directed, in coöperation with the National Advisory Cancer Council—
>
> (a) To conduct, assist, and foster researches, investigations, experiments, and studies relating to the cause, prevention, and methods of diagnosis and treatment of cancer;
>
> (b) To promote the coördination of researches conducted by the National Cancer Institute and similar researches conducted by other agencies, organizations, and individuals;
>
> (c) To procure, use, and lend radium as prescribed;
>
> (d) To provide training and instruction in technical matters relating to the diagnosis and treatment of cancer;
>
> (e) To provide fellowships for cancer research from funds appropriated or donated for such purpose;
>
> (f) To secure for the National Cancer Institute consultation services and advice of cancer experts from this country and abroad, and to coöperate with state health agencies in the prevention, control, and eradication of cancer.

At this point a few words of explanation of the National Advisory Cancer Council may be in order. The purpose of this Council, which is an appointed body of 6 members with the Surgeon General as ex officio member and chairman, is to advise the Surgeon General with respect to carrying into effect the provisions of the Cancer Act. Specifically, the Council is authorized to make recommendations in regard to cancer research projects submitted to it or initiated by it; to spread information about cancer studies "for the benefit of health agencies and organizations, physicians, or any other scientists, and for the information of the general public"; and "to review applications from any university, hospital, laboratory, or other institution, whether public or private, or from individuals, for grants-in-aid for research projects relating to cancer, and certify approval of projects deemed worthy of support."

The members of the Council first appointed were: Arthur H. Compton, professor of physics, University of Chicago; James B. Conant, president of Harvard University; James Ewing, director, Memorial Hospital, New York; Ludvig Hektoen, director, John McCormick, Institute for Infectious Dis-

* Read at a General Session on Cancer of the American Public Health Association at the Sixty-eighth Annual Meeting in Pittsburgh, Pa., October 19, 1939.

eases, Chicago; Clarence C. Little, director, Jackson Memorial Laboratory, Bar Harbor, Me.; and Francis C. Wood, director, Institute of Cancer Research, Columbia University, New York. The term of office of two members ends each year and at the end of the first year James Ewing and Francis C. Wood were succeeded by James B. Murphy, member of the Rockefeller Institute for Medical Research, and Mont R. Reid, professor of surgery, University of Cincinnati.

For the fiscal year ending June 30, 1938, Congress appropriated $400,000 for the cancer program of which $200,000 were for the purchase of radium. For the fiscal year 1938–1939, $400,000, and for the current fiscal year (1939–1940), $570,000 have been appropriated for the general purposes of the Cancer Act, without any specific allotments. I shall now discuss briefly what has been done to carry those purposes into effect, as a rule after conferences with special groups.

First, cancer research—Congress appropriated $750,000 for the building and equipment of the National Cancer Institute. The building, which is now being taken into use, is located at Bethesda, Md., on ground donated by Mrs. Luke I. Wilson and adjacent to the new buildings of the National Institute of Health. The development of an outstanding center for cancer research is assured. The chief of the Institute is Dr. Carl Voegtlin. The work is organized along the following broad fundamental lines.

1. The systematic study of the different primary factors which are concerned in the production of cancer in laboratory animals, in order to secure knowledge which may be useful in the prevention of human cancer.

2. Work on the mode of action of cancer producing agents, such as pure chemicals and radiations, for a better understanding of the carcinogenic process.

3. Biological and biochemical studies on cancer cells in order to seek an explanation for the characteristic biological behavior of such cells as compared with normal cells.

4. Work on experimental therapeutics using certain promising agents; and, in collaboration with the Bureau of Standards and the Carnegie Institution of Washington, a comprehensive study of the relative effectiveness of low, medium, and supervoltage x-rays, radioactive isotopes and neutrons.

A unique feature of the Institute is the opportunity for close collaboration of its scientific staff of about 30 competent scientists, representatives of physics, biochemistry, chemistry, biology, pharmacology, pathology, and bacteriology as well as statistics. The Institute also collaborates in exchanging information with other research laboratories. For the purpose of correlation close contact will be maintained with the recently opened tumor unit in the Marine Hospital in Baltimore. It is also planned to collaborate with certain university cancer clinics engaged in research.

Second, radium—As stated, $200,000 were set aside for the purchase of radium. The Cancer Act itself authorizes the purchase of radium from time to time, and that it be available for the purposes of the act; further that "for such considerations and subject to such conditions" as shall be prescribed by the Surgeon General, radium may be loaned to institutions in the United States "for the study of the cause, prevention, or methods of diagnosis or treatment of cancer, or for the treatment of cancer." Nine and one-half grams of radium have been purchased. Applications from 36 hospitals have been approved and shipments of radium are going out as fast as the radium is tested at the Bureau of Standards. Among factors taken into account in considering applications are the training and experience of the radiological staff, the equipment for radiotherapy, the need for radium in the community, and the number of cancer patients treated in the institution in question. Every effort

has been made to effect an equitable distribution of radium in order that as many sections as possible may have the benefit of its use. Each applicant is required to obtain the approval of his application by the state health department and the state cancer commission in states having such commissions established by law, or a statement explaining why approval is refused. This requirement is made in order to secure coördination with any cancer program carried on in the state by official agencies.

Third, training in technical matters relating to the diagnosis and treatment of cancer—The framers of the Act obviously were impressed with the needs of clinical cancer training because special provision is made for such training of proper persons who may receive a per diem stipend not to exceed $10 while in training. On the advice of the Cancer Council the Surgeon General submitted this matter for the consideration of an important group of representative consultants (Dr. James Ewing, chairman) who agreed that in order to promote the wider use of the best methods of diagnosis and treatment, opportunities for special training should be provided for physicians who wish to devote themselves to cancer work.

There are now some 25 carefully selected young physicians at work in coöperating cancer centers. Here is acknowledged the invaluable coöperation of these centers by their acceptance of trainees for instruction, along broad basic lines as well as for special purposes. The future careers of cancer trainees will be followed with special interest. A graduate of an approved medical school, who has completed a year's interneship in an approved hospital and who is not over 40 years of age, may be eligible for training provided he intends to devote himself to the clinical diagnosis and treatment of cancer and can furnish reasonable assurances that opportunities for such work will be available when he finishes his course. As a rule stipends for training will not be awarded for continuation of the applicant in the position he is holding at the time he makes his application. Only in exceptional cases will training be provided for a period of less than a year. In most cases at least 2 to 3 years will be desirable. Appointment as trainee is necessarily contingent upon the applicant being acceptable to a training center. In addition to interneship, prescribed training in surgery may be required. It is believed that the system of training in the diagnosis and treatment of cancer fostered by the Cancer Act, tends to promote the growth of facilities for instruction in clinical cancer work.

Fourth, fellowships in cancer research—The Act authorizes research fellowships "with such stipends and allowances" as may be deemed "necessary to procure the assistance of the most brilliant and promising fellows from the United States or abroad." Fellowships with reasonable stipends for work under proper conditions are highly important in developing investigators. With this objective in mind a number of fellows, men and women with promises of productive research, have been appointed for work on various phases of cancer—biochemistry, carcinogenesis, genetics, lung cancer, pathology.

Fifth, actions by the National Advisory Cancer Council—When the Cancer Act took effect the cancer research in progress under the auspices of the Public Health Service was concentrated in the National Cancer Institute. The Council approved the general program and also projects dealing with cancer statistics, incidence, and treatment. The studies of cancer incidence and treatment have yielded results of interest. The Council is charged with passing on applications for grants-in-aid of research relating to cancer. So far, 102 applications totalling 1½ mil-

lion dollars have been considered and 19 have been approved, the grants amounting in all to $159,000. The largest grants have been made to the University of California, toward the establishment under the direction of E. O. Lawrence of a cyclotron laboratory in biological and clinical work with special reference to the treatment of cancer. Grants have been recommended also for the American College of Surgeons toward the study of cancer clinics and hospitals, and in a small way for special needs of cancer clinics. The Council is interested in the possibility of more support for cancer clinics, especially when connected with medical schools and centers for cancer training. The Council approved in principle the establishment of a cancer unit in the Marine Hospital at Baltimore, with clinical, research and teaching facilities, in order to meet the cancer needs of the beneficiaries of the Public Health Service east of the Mississippi. The number of these beneficiaries is 170,000, 40,000 of whom are now in the cancer age.

Finally a few words about coördination and coöperation in federal anti-cancer activities. One of the first steps under the Cancer Act was the calling by the Surgeon General of a conference of representatives of foundations, medical schools, and other organizations for a discussion of the fundamental aspects of the cancer problem. A result was the appointment of a special committee (Dr. James B. Murphy, chairman) to consider the matter. This committee has analyzed and clarified the fundamental cancer problems in a report of great value to cancer investigators.* I have mentioned the recommendation by a group of consultants that special training be provided in the diagnosis and treatment of cancer. A committee, with Dr. Mont R. Reid as chairman, is working on cancer nomenclature with a view to securing better and more uniform records. By way of carrying out the provisions of the Cancer Act which directs that there shall be " coöperation with state health agencies in the prevention, control, and eradication of cancer," an office of states relations has been established. This office is prepared to furnish information and advice concerning anti-cancer programs and activities. Several states have availed themselves of this service.

I need not remind you that cancer is a major health problem because of its frequency and because most cancer patients are unable with their own resources to meet the costs of treatment. Several states now have laws providing for steps toward more adequate cancer service and as illustrated by the National Cancer Institute Act and by the recent state acts the ground is well prepared for cancer legislation. We are in fact in the midst of an expanding program of cancer control by coöperative efforts. The outlook is promising. Research is clarifying and deepening our understanding of the nature of cancer. Success in treatment grows with the increase in the skill, experience, and equipment devoted to clinical cancer service in easily accessible places; and especially as education leads to earlier and earlier action on the part of the patient.

In most cases early diagnosis and adequate treatment cannot be obtained by the unaided effort of the patient. Self-supporting people of moderate means need help in cancer as well as the wholly dependent. The immediate objective always must be to do the best that can be done at the time for every cancer patient no matter what his means or the stage of his cancer.

It is a notable fact that in some localities modern cancer service is now within fairly easy reach of all classes, but it is distressing how little has been

* *Pub. Health Rep.*, 53:2121, 1938.

done in so many other places to provide such service, in comparison with what could be done by better organization. It would be easy to spot such areas of deficiency in cancer facilities even in states with official programs. The lag between the acquisition of useful knowledge and its practical use is illustrated strikingly by the widely varying degrees to which adequate cancer service is available in different parts of the country. Enormous shortcomings exist as shown by the amount of accessible cancer that slips through into the incurable stage. Here are needs that cannot be met except by the organized coöperative action of various public and private agencies.

War and Nutrition

MORE than ever before, the current conflict is a war of starvation. You and I know that the mass health of people is impaired by inadequate diets. Even in our own countries which are at peace, adequate nutrition of the masses is one of our most important health problems. We cannot help but view with alarm the effects upon a whole generation of this present war of starvation. To illustrate the importance which the nations at war attach to this matter, I can tell you that in each of the warring nations any publication of results of new researches in the nutritional field is prohibited during the duration of the conflict.

Added knowledge of nutrition is a military secret, being considered a potential weapon in the hands of the enemy.—Dr. Thomas Parran, in an address at the Opening Session of the Fourth Pan-American Conference of National Directors of Health, May 1, 1940.

The Foundry Dust Hazard and Its Control*

M. F. TRICE

Industrial Hygienist, Division of Industrial Hygiene, North Carolina State Board of Health, and North Carolina Industrial Commission, Raleigh, N. C.

IN the present paper a small foundry viewpoint may creep into the discussion, but that is fitting inasmuch as recent studies [1, 2, 3] in several states have revealed that a majority of the plants employ less than 100 workers. Therefore, as regards the problem of the foundry dust hazard and its control in the industry generally, it is to the category of relatively small plants that much of the labor of governmental and private industrial hygienists must be directed.

RESULTS OF PREVIOUS STUDIES

As with any hygienic dust hazard, the pathology developing as a result of occupational exposures is largely confined to the respiratory system although some investigators have not lost sight of other ills that may be traced to foundry dust. Inasmuch as siliceous materials are employed extensively, it is logical that an evaluation of the extent of the dust hazard be based primarily upon the incidence of silicosis.

Although many studies have been made in recent years, two stand out as being representative of the industry generally. These studies represent a wide distribution of plants as to size, and the results obtained are based upon the examination of all employees rather than of a selected group of workers. These two studies reveal incidence rates for silicosis that are in remarkably close agreement. In New York State [4] and in North Carolina [5] only 2.7 per cent and 1.5 per cent respectively, of all foundry workers were found to have silicosis. In New York, the rate given is for all types of foundries. Steel foundries have a slightly higher rate. The iron foundries have very nearly the same rate as that for all types and are thus comparable with the North Carolina data, which represent iron foundries exclusively. The technic differed in that only x-ray examinations were made in New York, whereas both clinical and x-ray examinations were made in North Carolina. Other studies [6, 7, 8] have revealed that from 7 to 30 per cent of the workers examined had silicosis, but such results are based, not upon entire foundry populations, but upon the examination of only a portion of the workers. Greenburg [9] found that the incidence of silicosis for molding, grinding, chipping, tumbling, and abrasive blast cleaning ranged from 3.1 per cent for tumbling to 4.8 per cent for chipping.

The several investigations referred to reveal that foundrymen seldom suffer from the advanced stages of the disease.

* Read before the Industrial Hygiene Section of the American Public Health Association at the Sixty-eighth Annual Meeting in Pittsburgh, Pa., October 20, 1939.

Thus, the Metropolitan Life Insurance Company,[8] Sander,[6] and Greenburg and his coworkers [4] disclosed that 94.5, 91.4, and 80 per cent of the silicotics encountered in the respective groups exhibited first stage, or simple, silicosis. In North Carolina [5] none of the cases discovered had progressed beyond the initial stage. The low incidence of advanced pathology among silicotic foundrymen is heartening in that simple silicosis, the most prevalent stage of the disease, is not disabling [11] and is only slowly progressive.[12]

Parenthetically, it is pertinent to state that the discoveries and experiences of the past few years with respect to the extent of the foundry dust hazard have been reflected in progressive premium reductions for specific occupational disease loadings in workmen's compensation insurance rates. Thus, in 1936 the specific occupational disease loading was $3 for $100 of payroll; in 1937 it was $2.13; and in October, 1938, it was still further reduced to $1.29. These figures indicate an ever decreasing appraisal of the extent of the risk to health involved.[44]

The length of time required for silicosis to develop varies considerably. In North Carolina [5] all cases, with one exception, developed only after an exposure of 30 years. Greenburg,[14] found silicosis among workers in every exposure classification beyond 2 years but reports the majority as representing exposures in excess of 30 years.

The incidence of silicosis does not tell the whole story. All the investigations cited revealed that many of the foundry workers diagnosed as essentially negative with respect to silicosis exhibited increased pulmonary fibrosis. Thus, in New York,[15] 4.5 per cent and in North Carolina,[16] 8.2 per cent of the men examined exhibited marked exaggeration of the normal lung markings. Sander [6] reports that 71 per cent of the cases reviewed showed more pulmonary fibrosis than usual. In North Carolina fibrosis was found among workers with less than 10 years' exposure, and in New York the condition was most prevalent among men employed from 20 to 24 years. The incidence of fibrosis suggests that long before the development of well defined silicosis the inhalation of dust results in lung changes that are evident upon x-ray examination. This incipient dust pathology increases in significance when certain morbidity and mortality data are reviewed.

McConnell and Fehnel [17] cite statistical studies which revealed the death rate for respiratory diseases among iron and steel workers to be about 2⅓ times that in all industries combined and that more deaths resulted from pneumonia than from any other cause. A similar situation was found for brass and bronze foundry workers except that the rates in general were higher than for iron workers, and deaths from tuberculosis were more numerous than from pneumonia. British statistics [18] confirm such American findings. Britten [19] found bronchitis prominent among foundry workers with 10 years or more of service.

Jones [20] states that the incidence of pulmonary tuberculosis is highest among the workers in the siliceous industries, and Gardner [21] and others [22] have found with experimental animals that silica increases susceptibility to tuberculosis. Sander [12] concludes, based upon serial observations, that silico-tuberculosis is primarily a reactivation of previously acquired, but walled off, tuberculosis and that his studies suggest that the tuberculosis rate is not raised by dust exposure, *per se,* but rises only after silicosis becomes definitely established. On the other hand, Brumfiel and Gardner [23] state that "advanced silico-tuberculosis is neither that of silicosis superimposed upon a preëxisting focus of tuberculosis nor the reverse. It appears more like a mixture of reactions to

both tubercle bacilli and to silica in the same area."

Among foundrymen the incidence of pulmonary tuberculosis varies. Thus, clinically significant tuberculosis complicated silicosis in only 2.6 per cent of the cases in Massachusetts,[24] only 13.6 per cent of the cases in New York,[25] and in 37 per cent of the cases in North Carolina.[16] The Metropolitan study [8] disclosed only 1 case complicating silicosis. Sander [12] found that 22 per cent of the silicotics, however, had definitely active cases. Only 1 of the 45 North Carolina foundrymen exhibiting fibrosis had tuberculosis.

With respect to healed primary tuberculosis, 4 such North Carolina cases [16] displayed no evidence of dust pathology after exposures ranging from 21 to 38 years. Moreover, 2 workers who had been in the industry for 37 and 48 years, respectively, exhibited apparently healed pulmonary tuberculosis but no dust pathology. Greenburg [25] observed a similar situation.

In addition to respiratory afflictions, exposure to high concentrations of dust may lead to other disorders. Britten [26] points out with respect to the foundry industry that an important factor in impaired hearing is the physical character of the dust, which causes a large number of cases of impacted wax.

It is evident at present that the hazards to health attending exposure to foundry dusts are not confined to the much publicized silicosis and complicating tuberculosis but include, as well, a great many of the respiratory diseases. Occasional absence, therefore, of well defined silicosis among workers in a foundry not equipped with dust control safeguards should not be accepted as indicating the nonexistence of a dust hazard.

An average dust concentration of 15 million particles per cu. ft. of air is considered non-hazardous in New York State [27] while in North Carolina a threshold limit of 12 M.P. is accepted.

DUST SOURCES IN THE FOUNDRY

An examination of foundry operations reveals the most flagrant sources of dust to be mechanical sand conditioning, casting shakeout, and casting cleaning.

Molding, *per se,* does not generate excessive dust, except perhaps where compressed air is used for blowing off molds or where a sand slinger is used. Gray [28] reports an exposure of 32 M.P. for this type of work. In some small North Carolina foundries molding exposures, when uncomplicated by dust from other sources, range from 1 to 12 M.P. Gray [29] corroborates such results, as do Hatch and his associates.[30] Yet, in some plants the dust exposure of molders occasionally exceeds 200 M.P. Such excessive dust concentrations may be traced to other operations, most often to some form of casting cleaning —here employed broadly to include shake-out, core removal, sprue cutting, grinding, bristle brush cleaning, and abrasive blasting. Occasionally casting cleaning, for example, and molding will be carried on concurrently in the same workroom. Particle counts on samples of dust collected in such plants occasionally have revealed almost identical concentrations in casting cleaning and molding areas, indicating a drift of atmospheric pollution from one department to another with no diminution in concentration.

It is unlikely that the conditioning of sand on the molding floors is ever attended by the generation of harmful concentrations of dust, as the sand is always dampened thoroughly prior to working. Dust counts have revealed an average concentration of 4.6 M.P. for machine sand-cutting and 13.8 for hand sand-cutting.[31] The mechanical conveying of sand and its conditioning in machines, however, may be responsible for a high atmospheric dust concentration in the molding room. Gray [32, 33] reports dust concentrations of the order of 40 M.P. in the vicinity of mechanical

sand conditioning equipment. And, the Metropolitan study [34] revealed for sand conditioning operations dust concentrations exceeding 100 M.P. and one as great as 527 M.P.

Core making and metal pouring do not generate hazardous concentrations of dust; generally excessive exposures in this work indicate the existence of nearby dusty operations.

All phases of casting cleaning, when performed without adequate control measures, produce hazardous amounts of dust. The exposure in shaking out castings frequently exceeds 20 M.P.[35, 36] and in many plants daily exceeds 200 M.P.[37] Core removal, arbor pulling, and grinding may be equally dusty. Tumbling, when unexhausted machines are employed, may generate as much as 250 M.P. of dust. Sand-blasting is attended by flagrant dust exposures in many plants. For example, a workman has been observed sand-blasting small machine parts with only a handkerchief across his face in an atmosphere containing more than 200 M.P of dust per cu. ft. of air. Either of the frequently observed practices of sand-blasting in the plant yard or in a poorly constructed room may be responsible for an increase in the dust exposure of other workers.

CONTROL OF THE DUST HAZARD IN THE FOUNDRY INDUSTRY

With respect to the control of the dust hazard in foundries, good housekeeping is a relatively simple and inexpensive expedient, and yet it is most effective. Hatch [1] has demonstrated in a unique manner that the atmospheric condition and the incidence of silicosis are definitely related to both good housekeeping and plant activity.

The chief factors in a good housekeeping program are the maintenance of enclosures in a good state of repair; the removal from the workroom to storage of all unnecessary equipment; keeping floors free of accumulations; keeping floors damp; the frequent removal of dust deposits from structural members, exposed pipes, and machinery; the removal of grime from window lights; and the frequent cleaning of walls. In this connection, the safety engineer of one large plant [38] states that a concrete floor aids materially in keeping a plant clean, while the superintendent of another large foundry [39] concurs in this view, adding that white walls and the vacuum cleaning of floors are assets. He bans brooms and adds, "It is our belief that dust suppression is equally as essential as dust collection." Gray [40] reports that the introduction of good housekeeping practices in one foundry resulted in a reduction of dust from a high of 125 M.P. to 8.0 M.P.

Good natural ventilation is a valuable asset in the control of dust. Roof ventilators should be provided in every foundry building. The monitor top type roof is especially recommended.

Although good housekeeping is an important part of a dust control program, nothing short of exhaust ventilation will completely eliminate the occupational disease hazard attending the shake-out, core removal, arbor pulling, tumbling, grinding, sand-blasting, and sand conditioning in mechanical equipment.

In North Carolina [41] the exhaust ventilation of grinding wheels and tumbling mills has been found to effect a 94 per cent reduction in the dust exposure of the operators. These two operations, together with casting shake-out, are the principal sources of dust in the small foundry; however, due to the character of the dust, the shake-out exposure in equal concentrations is not as hazardous as the others.[42] The shake-out exposure in the small plants must be controlled partially by good housekeeping.

The modern mechanized foundry is most amenable to the control of dust

by exhaust ventilation. In such plants flask dumping mechanisms, the rotary shake-outs, the tumbling mills, the grinding wheels, and the sand conditioning system all may be readily ventilated, with resulting complete control of the dust hazard.

In summary, the essential factors in the control of foundry dust are: (1) good housekeeping, (2) exhaust ventilation, (3) tight enclosures, (4) isolation of some processes (swing grinders, for example, where they are not exhausted), (5) substitution, where practicable, of steel shot for sand in abrasive cleaning, (6) the dampening of floors, (7) the use of respirators for exposures of short duration, (8) the use of positive pressure air helmets for sand-blasting and swing grinding where the latter are not exhausted, and (9) the proper maintenance of equipment. To these essential factors should be added preëmployment examinations and periodic inspection by governmental and other agencies. Such inspections appear to be most helpful with respect to small establishments that frequently have little contact with other plants in the industry. The official visitor is often the only person to commend or exhibit any interest whatever in a dust control program.

CASH VALUE OF A DUST CONTROL PROGRAM

With respect to the dollar and cents value of a dust control program, one foundry official[38] states with respect to dust control that it has reduced costs approximately 10 per cent and spoilage now is approximately only 1 per cent. Furthermore, the expenses of making the changes necessary were written off by savings effected in one year. An official of another foundry states,[43] "Improved production, savings in lighting, and increased salvage, no less than improvement in the health and morale of workmen, are the advantages we have obtained from our extensive installation of dust control and dust collecting apparatus. Nevertheless, had there been no savings in money, we would have been satisfied in the knowledge that we had done something merely humane in protecting the men who work for us. In improving their health we only follow the wisest policy in industrial management, the policy of constant betterment of every phase of production which alone can maintain progress in quality and plant output."

In practically all states a monetary reward in the form of reduced premiums for specific occupational disease compensation insurance may be realized by the installation of dust control equipment and the institution of good housekeeping practices. The maximum premium credit is 35 per cent, which may be earned in accordance with the following rating schedule:

	Per cent
Casting cleaning	9
Shake-out	5
Molding process	3
Sand conditioning	3
Housekeeping	5

The total of such credits is 25 per cent, but a bonus of 10 per cent is given for the compliance with *all* standards; thus, a premium credit of 35 per cent is possible. In 1937 in North Carolina there were 9 foundry risks, of 16 inspected, that received credits under the schedule rating plan; in 1938 there were 16 foundry risks, of 17 inspected, that received such credits. In the latter year the credits ranged from 3 to 35 per cent of the foundry loading, that is, the premium charged per $100 payroll. The average credit earned during the year 1938 was 7.9 per cent; however, several foundries qualified for the maximum credit.[44]

Thus, there accrue as a result of the installation of dust control measures many benefits that may be appraised in terms of dollars and cents savings.

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Some Statistical Needs for Proper Administration of Maternal and Child Health Programs*

EDWIN F. DAILY, M.D., F.A.P.H.A.
Director, Maternal and Child Health Division, U. S. Children's Bureau, Washington, D. C.

THE physicians administering the maternal and child health aspects of public health programs, and other physicians interested in this work must seek from the vital statisticians some of the tools with which they work. These tools include accurate statistical data. The vital statisticians have a real responsibility to the community in providing the service agencies with accurate information from which intelligent programs can be planned which will lead to a reduction in the mortality and morbidity of pregnancy and infancy.

Generally speaking, the statistical needs for maternal and child health programs can be divided into two groups: The vital statistics usually available in any state, and supplemental statistical information which is usually essential to proper interpretation of the basic vital statistics. Consideration is not given in this paper to statistics related to tabulation of services rendered individuals nor to progress reports. This paper will be limited also to consideration of statistics relating to the maternity and neonatal aspects of the maternal and child health program.

The vital statistics relating to maternity and early infancy which are usually available in any state, county, or large city, and which are a part of the basic information in planning any health services for mothers and infants, are as follows:

1. Live births and stillbirths (number and rate)
 a. Urban, rural
 b. Resident and nonresident
 c. In hospitals, in homes
 d. Attended by physician, not attended by physician
 e. Legitimate or illegitimate
 f. Race
2. Maternal deaths (number and rate)
 a. Urban, rural
 b. Resident and nonresident
 c. In hospitals, in homes
 d. Attended by physicians, not attended by physicians
 e. Causes
3. Neonatal deaths (infant deaths under 1 month of age)—number and rate
 a. Urban, rural
 b. Resident and nonresident
 c. In hospital, in homes
 d. Attended by physician, not attended by physician
 e. Race
 f. Causes of death
 g. Age at time of death

Ideally, a copy of the certificate for every live birth occurring in a home should be in the hands of the local health agency within 24 hours after the birth. The public health nursing serv-

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ice rendered in the home within the first 24 or 48 hours of a child's life will be more valuable than at any other period of his life.

Women who have been given public health nursing service during pregnancy and at time of delivery naturally receive this service, but they are a small percentage of the total. A large proportion of the women delivered at home in the United States are still not brought under public health nursing supervision until after the delivery, if then. We believe that the high infant mortality during the first 2 days of life can be reduced if proper nursing as well as medical supervision is given. Nursing assistance and instruction is especially needed for the prematurely born infants. Only in communities where the local health agency is currently informed of each birth in the area is this early postpartum nursing service possible.

Laws requiring the reporting of a premature birth within a few hours of the time of birth have in a few areas aided the public health agency to render immediate service to this large group of infants in need of special care.

In addition to the statistics now available on births by residence, it would seem desirable to have for each county or city in the United States data concerning (a) the number of residents delivered of live-born infants in the area; (b) the number of residents with live births in other areas; (c) the number of nonresidents with live births in the area. When many women resident in an area are delivered outside the area (or vice versa) it seriously affects the interpretation of birth rates for those areas. The Bureau of the Census is considering a new method of securing and reporting this type of information. I will refer to it again as it relates to maternal and infant mortality.

Concerning stillbirths there is much additional information needed. There still remains a lack of uniformity in state laws or regulations relating to the reporting of stillbirths. Until all of the states have adopted the same regulations we cannot hope to obtain comparable statistics. There is also a general lack of knowledge among physicians concerning the legal definition of a stillbirth in their state. Information concerning causes of stillbirth is woefully inadequate. If all of the states adopt the new stillbirth certificate we may obtain extremely valuable data concerning the factors responsible for the death at or before birth of over 70,000 infants each year. The International Committee on Causes of Death last year recommended a new classification for causes of stillbirths. If the new stillbirth certificates are adopted in all states, and if physicians will endeavor to complete them as accurately as possible, we will be able to classify this group of deaths by causes, and we hope that before the next international meeting the United States will have sufficient information regarding the etiology of stillbirths to offer further suggestions for the classification of this group of deaths. The information from the new stillbirth certificates will also assist us in planning measures which may prevent many of these deaths in the future.

The present classification of causes of infant deaths is recognized by all countries as unsatisfactory. Under such indefinite causes as "congenital debility" or "prematurity" or "other diseases of early infancy," are classified more than 40,000 infant deaths each year for which much more accurate data are needed if we are to plan intelligently how to prevent as many of these deaths as possible. We hope that several states will study neonatal deaths with one of the objectives in mind to outline a more satisfactory classification for this group of infant deaths.

The excellent statistical material we have had over a long period of years relating to maternal mortality has en-

abled physicians to study this group of deaths more closely than those from almost any other cause. The comprehensive maternal, stillbirth, and neonatal studies made by groups of physicians in several cities and a few states in recent years have been possible only when there is the closest coöperation between the medical group making the study and the local vital statisticians. Examination of maternal death certificate alone gave the public health administrators and obstetricians insufficient information for determining whether the death was preventable. Cause of death alone was not sufficient. If it was a maternal death, what were the complications of pregnancy and labor that might have been responsible? A death certificate stating the cause of death as "puerperal sepsis" means very little, but add the information that pregnancy and labor were complicated by contracted pelvis and a 3 day labor followed by cesarean section, and that the patient lived in a rural area 50 miles from a hospital, and we can determine whether similar deaths can be prevented in the future. Many neonatal deaths are certified as being due to "prematurity." This information becomes more valuable if we learn that pregnancy was complicated by a toxemia and that the patient did not receive prenatal care. Mortality records become very valuable when additional information relating to each death can be obtained and considered in relation to the economic status of the families in the areas and to the accessibility of medical, nursing, and hospital care. Communities which are able to obtain and study this type of information are in a position to plan measures which should reduce the number of avoidable deaths.

It is generally agreed that the studies which have been made and published have had a profound influence in at least four directions: (1) They have brought to the attention of the communities the underlying factors responsible for many of these deaths, such as ignorance of the patient or lack of facilities for medical and hospital care for maternity patients and infants. (2) They have impressed forcefully upon the physicians the fact that a certain proportion of these deaths are the result of lack of knowledge on the part of the attending physician. (3) They have often given us new knowledge of the measures that can be taken to prevent many of these deaths in the future. (4) They have in practically every instance shown the vital statisticians that inaccurate causes of death are often entered on death certificates and have made it urgent for them to seek ways and means of securing more accurate and more complete information. They have also pointed out the incompleteness of the registration of live births and stillbirths.

From the combined conclusions of many of these studies, the Children's Bureau, in coöperation with the Bureau of the Census, recommended revised birth and death certificates so that not only physicians and public health administrators but also the statisticians will be provided with more complete information for use in their own community and with comparable statistics from other communities. There are several items on the revised death and birth certificates which warrant special mention.

On the standard death certificate under "Other conditions causing death," there is a parenthetical note (Include pregnancy within 3 months of death). It is hoped that this note will call to the attention of the attending physician the importance of mentioning pregnancy, whether or not it was directly related to the death. Careful review in some cities of all death certificates of women between the ages of 15 and 45 has shown that in many instances sepsis is

given as the cause of death, and pregnancy is not mentioned, even though the death was caused by puerperal sepsis. Sometimes as many as one-fourth of all maternal deaths are recorded under "other causes" because of failure to mention pregnancy on the death certificate.

The supplemental information requested for inclusion on all live birth certificates includes the following:

Complications of pregnancy
Complications of labor
Was there an operation for delivery
State all operations

Forty per cent of the new state birth certificates received by the Bureau of the Census from the states up to September 20, 1939, included this supplemental material. Note that these same questions are also on the stillbirth certificates.

In several states failure to adopt the entire new birth certificates has been due to the objections of vital statisticians. I believe that if they had fully appreciated the value of the additional information requested it might have outweighed their justifiable criticism. The greatest value of the new information obtained by the states adopting these certificates completely will be to give us for the first time the relative importance of certain complications of pregnancy and labor as they relate to live-born infants that remain alive, to live-born infants that die in the neonatal period, and to stillborn infants. For example, for 100,000 live births we may have 10,000, or 1 in 10, certificates which will indicate toxemia of pregnancy as a complication. If a study of neonatal deaths shows that one-half of their live birth certificates show toxemias of pregnancy as a complication, it will give us some idea of the importance of toxemias of pregnancy to the neonatal death rate. During this same period the certificates for 10,000 stillbirths may show an incidence of 50 per cent with toxemia as a complication of pregnancy. The relationship between serious complications of pregnancy and labor and the causes of maternal, stillbirth, and neonatal death rates, have never been carefully studied. There is every reason to believe that the information obtained from these certificates, if carefully studied and used, will pave the way for many valuable preventive health measures.

We have recently asked the Bureau of the Census to make available annual maternal and infant mortality rates in relation to residence. Further data relating to deaths of mothers or infants resident in one area who are delivered or died in other areas as nonresidents, if wisely interpreted, will be important in evaluating the adequacy of existing facilities for the care of these patients.

Information concerning the relationship between neonatal mortality and the period of pregnancy when the birth occurred, can now be obtained by matching birth and death certificates. The matching of maternal death certificates with birth certificates (if a birth occurred) can also give us much needed information regarding the relationship between causes of maternal mortality and the period of pregnancy. Measures instituted to prevent mortality in the early months of pregnancy must often be quite different from those for preventing mortality in the latter months of pregnancy.

It would also seem desirable to have in each state statistics concerning the deaths of *all* women who were pregnant at the time of death, or who had been pregnant within 3 months of death. This would mean tabulating both the deaths assigned to puerperal causes and the deaths associated with pregnancy which were assigned to nonpuerperal causes. More knowledge is needed about the rôle pregnancy plays in causing many deaths now assigned to heart disease, chronic nephritis, and other

conditions which might not have caused death if pregnancy had not occurred.

Further analysis should be made of maternal, neonatal, and stillbirth mortality in relation to the type and size of hospital where death occurred. A study in Ohio in 1938 showed that maternal mortality in small hospitals was more than 4 times as great as in the large hospitals approved by the American Medical Association for internship. State-wide studies of this type, if carefully interpreted, might lead to important conclusions relative to the facilities for proper care of maternity patients and infants in these hospitals.

The U. S. Bureau of the Census has reported that 38.5 per cent of all maternal deaths occur at home. Does this indicate that these women were unable to obtain hospital care because of economic status or lack of hospital facilities, or are there other explanations? A study of maternal deaths occurring at home should be made in relation to cause of death and location.

Vital statisticians and registrars occasionally ask why there is so much interest in maternal, infant, and stillbirth mortality when there are so many deaths from other causes. As a matter of fact, these deaths account for approximately 14 per cent of all deaths in the United States each year, and actually total more than the combined deaths from all communicable diseases. Not only is the total great, but it constitutes a loss of life largely unnecessary and of profound social and economic importance. In each state there is a director of maternal and child health who is responsible for the administration of the maternal and child health program. We have repeatedly encouraged these physicians to coöperate with the vital statisticians in their states in obtaining information essential in the development of the maternal and child health program. In turn, I ask you as vital statisticians to inform the maternal and child health director of the statistics you have available for his use. Perhaps at times you will find that there is much additional information which could be readily obtained by your department which would be extremely valuable to maternal and child health divisions.

Evaluating the Health Education Program of a Health Department*

CLAIR E. TURNER, DR.P.H., SC.D., F.A.P.H.A., AND MABEL R. STIMPSON, C.P.H.

Professor of Biology and Public Health, Massachusetts Institute of Technology, Cambridge, Mass.; and Supervisor of Nutrition, Infant Welfare Society of Chicago, Chicago, Ill.

THE following questions and criteria for judging the effectiveness of the health education program in a health department are based on proposals which have been suggested in the literature (See Bibliography) and on the experience of surveying the health education activities of the Detroit Health Department in the summer of 1938.

The criteria have been divided into two sections. Section one includes proposals for evaluating the activities of the health education division. They are criteria which apply to the principal educational efforts of health departments.

Section two includes the criteria for evaluating the health education activities of the other bureaus or divisions whose principal functions are in some other technical field of public health.

Criteria for evaluating the health education activities of the school are not included. Such suggested standards may be found in the literature.[2, 13, 14, 18, 20, 29, 31]

1. CRITERIA FOR EVALUATING THE ACTIVITIES OF THE HEALTH EDUCATION DIVISION

1. Are the objectives sound and adequate in promoting a knowledge of, and favorable attitude toward:
 a. The health department activities?
 b. The maintenance of physical and mental efficiency?
 c. The adequate utilization of the services of the private physician?
2. Are the principles underlying the educational program effective in that:
 a. The coöperation of organized medicine is secured.
 b. Education of the physician precedes public education with respect to new public health activities.
 c. The opportunity is given to community leaders to participate in planning and conducting health education activities.
 d. Measures and activities possible of accomplishment are proposed.
 e. The educational program is planned to reach as many members of the family as possible.
3. Is the instructional material:
 a. Accurate?
 b. Based on a study of community needs?
 c. Adjusted to the economic, racial, religious and intellectual status of the group reached?
 d. Presented at the psychological time?
4. Does the educational program reach:
 a. The health department staff?
 b. The medical profession and allied professions?
 c. Leaders in the community?
 d. The public at large?
 e. School groups?
 f. People needing special health advice, such as food handlers?

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5. Does the educational program utilize a sufficient variety of educational methods including:
 a. Individual instruction by physicians, nurses, inspectors and other professional workers?
 b. Group conferences?
 c. Talks or lectures?
 d. Radio programs (lecture, interview or drama)?
 e. Written material including:
 (1) Newspaper publicity (news stories, editorials, "filler," special supplements)?
 (2) Pamphlets?
 (3) Letters (personal letters, form letters)?
 (4) Cards?
 (5) Handbills or flyers?
 f. Visual material including:
 (1) Stereopticon slides?
 (2) Moving pictures?
 (3) Exhibits?
 (4) Bill boards?
6. Are important educational media utilized to a sufficient degree to comply with the American Public Health Association standards which appear in the following chart?

CHART

QUANTITATIVE STANDARDS FOR THE UTILIZATION OF CERTAIN EDUCATIONAL MEDIA *During One Year* AS ESTABLISHED IN THE AMERICAN PUBLIC HEALTH *Appraisal Form for Local Health Work*, 1938

Division or Bureau	*Pamphlets or Letters*	*Newspaper Publicity*	*Lectures, Talks, Motion Pictures*
Acute Communicable Disease	Two pamphlets to be distributed per case of typhoid fever, measles, scarlet fever, whooping cough, diphtheria, reported	News articles in the local newspapers for each of the five numerically most important communicable diseases	
Syphilis and Gonorrhea	Three pamphlets to be distributed per case reported	Items in local newspapers at least 3 times	Attendance at meetings to be equal to 4% of total population
Tuberculosis	Three pamphlets to be distributed per case reported	Items in local newspapers at least 3 times	
Maternity Hygiene	One pamphlet or series of letters to be distributed per birth reported		Classes reaching 50% of antepartum cases carried for nursing service
Infant and Preschool Hygiene	One pamphlet to be distributed for each live birth and preschool child	One comprehensive article or two briefer articles in local newspapers	
General Sanitation	Pamphlets to be available for general distribution covering 4 major topics	Items in local newspapers	
Food and Milk Control	Pamphlets to be available for general distribution covering 6 major topics	Items in local newspaper at least once	

7. Does the director of health education possess suitable educational qualifications * (or extensive experience)?

2. CRITERIA FOR EVALUATING THE HEALTH EDUCATION ACTIVITIES OF THE BUREAUS OR DIVISIONS WHOSE PRINCIPAL FUNCTIONS ARE IN SOME TECHNICAL FIELD OTHER THAN HEALTH EDUCATION

A. *Criteria which may be applied to all bureaus or divisions*

1. Are the findings of the division made available to other professional workers to whom they may be useful such as:
 a. The director of health education?
 b. Workers in other bureaus or divisions of the health department?
 c. Physicians and dentists?
 d. Public and private health agencies?
2. Are the findings of the bureau presented in such a form as to be useable and understandable?
3. Are the activities of the division available to professional workers for inspection and study?
4. Is there in-service training for staff members through:
 a. Staff meetings?
 b. Printed material such as reports of new findings in administration and research?
 c. Refresher courses?

B. *Criteria which apply to bureaus and divisions which operate clinics and carry on home visiting*

1. Is there an administrative policy which expects the patient to be advised and instructed by the physician and allows sufficient time for such education?
2. Is there individual nursing instruction touching the care of the patient in the home, and instruction in nutrition to assist in carrying out food treatment, as a part of medical treatment, for patients requiring it?
3. Is there group medical and nutritional education provided for patients when this is feasible?
4. Does the patient's record provide space to indicate the health instruction given?
5. Are posters, pictures and exhibits used in clinic waiting rooms as methods of educating the patients?
6. Is printed material available for distribution where such material would be helpful?
7. Do the public health nutritionists and nurses who carry on this program meet the educational qualifications set by their respective associations? * †
8. Is there sufficient nursing staff (15–20 per 100,000 population) to carry out the educational program which should be contributed through public health nursing?
9. Are nursing visits provided to a sufficient degree for communicable diseases, tuberculosis, maternity, infant and preschool hygiene to comply with the American Public Health Association standards? [2]

C. *Criteria which apply to bureaus and divisions using inspectors in the field*

1. Is it departmental policy to utilize education methods rather than legal authority in securing adherence to rules and procedures recommended by the health department?
2. Is the public informed concerning the sanitary standards of the health department through:
 a. Posted notices?
 b. Copies of sanitary regulations sent to persons concerned?
3. Have the sanitarians or field workers sound factual training for their work, and the ability to impart the necessary knowledge? [15]

* The American Public Health Association through its Committee on Professional Education recommends a planned program for undergraduate work followed by at least 1 year of graduate study in health sciences and in methods and materials of public health education.

* A joint committee of the American Dietetic Association and the American Home Economics Association recommends a planned program for undergraduate work followed by graduate study and experience.[11]

† The American Public Health Association through its Committee on Professional Education recommends educational qualifications for public health nurses which are approved by the National Organization for Public Health Nursing and by the Governing Council of the American Public Health Association.[12]

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Genetic Constitution in the Rabbit and Antibody Production*

C. A. STUART, PH.D., K. M. WHEELER, PH.D., AND P. B. SAWIN, SC.D.

Biological Laboratory, Brown University, Providence, R. I.

IT is not a new observation that wide variation in immunologic response may occur among several animals inoculated with the same antigen. Several explanations for the variations have been proposed, and it seems certain that age, the physiological condition of the animal as influenced by diet and living conditions, and inherited characteristics, are factors influencing immunization. For example, it is common laboratory experience that two or three rabbits should be immunized to be sure of obtaining a precipitin serum sufficiently potent for forensic tests. For the production of diphtheria antitoxin certain horses which have slight normal antitoxin are more suitable than others.

In the case of immunization of rabbits with human blood cells it was noticed that certain rabbits failed to respond to the injection of A cells, and the reason was shown by Witebsky[1] to be due to the presence of an A antigen in the tissues of these rabbits. This situation is similar to that for the human O, A, B, and AB blood groups, where the presence of antigen in the body tissues determines the absence of the corresponding antibody from the serum. Furthermore, rabbits lacking the A antigen possessed normal anti-A agglutinins in their sera.

In the course of some work at Brown University with the anti-human rabbit sera it was noticed that one stock of rabbits consistently yielded good titering immune specific anti-A agglutinins while other rabbits failed to do so. At the time, a good sized rabbit colony was being maintained for genetical work, and it was decided to test these animals for normal agglutinins for human blood cells of the various groups. Some 40 or more rabbits were immunized with A cells, and specific antibody formation was found to correlate with the presence of normal specific A agglutinins.[2] Among 9 inbred, or closely bred families in which the animals were distributed[3] one family was found in which the animals were all of one type—all possessed A agglutinins—and consequently could yield potent A antibodies after immunization.

The data suggested that the ability to immunize was inherited, and possibly in a simple Mendelian fashion. Subsequently, a few cases have been found in which atypical, and for the most part temporary, A agglutinins were present. These were unlike the usual normal agglutinins and occurred even when an A antigen was present in the rabbit tissues. Breeding tests were carried

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out, in conjunction with other genetical work, to determine the mechanism of inheritance of the ability to yield strong anti-A agglutinins (as indicated by the presence of normal A agglutinins, or by the absence of A antigen in the rabbit serum shown by a negative complement-fixation test with the appropriate antiserum). Good evidence for inheritance was found.[4] Results of the breeding tests to date are summarized in Table 1.

tive to 231 rabbits with A agglutinins—well within the chance variation from the 219 expected. From the homozygous recessive mating 225 progeny were obtained. This includes 150 rabbits which belong to the Family I strain, Family I being a pure recessive stock. The deviations of the experimental from the theoretical ratios, although within chance error, have always been toward an excess of alpha animals. The significance of this is uncertain. A rare

TABLE 1

Inheritance of the A Character

Genotype	*Normal Agglutinin*	*Immunizing Capacity*
A_nA_n	absent	—
A_na_n	absent	—
a_na_n	present	+

Type of Mating	*Type of Progeny*	*Number of Progeny*	*Expected Ratio*	*Chi Square*
$\frac{A_n}{A_n} \times \frac{A_n}{A_n}$ or $\frac{A_n}{a_n}$	A_n	30	30	
	a_n	0	0	
$\frac{A_n}{a_n} \times \frac{A_n}{a_n}$	A_n	205	209.2	0.22
	a_n	74	69.8	
$\frac{A_n}{a_n} \times \frac{a_n}{a_n}$	A_n	208	219	1.10
	a_n	231	219	
$\frac{a_n}{a_n} \times \frac{a_n}{a_n}$*	A_n	0	0	
	a_n	225	225	

* This mating includes 150 animals in Family I.

The mechanism of inheritance is illustrated at the top of the table; A_n representing the dominant and a_n the recessive factor. Only the homozygous recessive animal possesses normal specific A agglutinins and can yield strong immune antibodies. The first type of mating involves parents, one or both of which may have been a homozygous dominant since no negative (lacking A agglutinin) offspring occurred. The double heterozygous mating gives a ratio of 205 to 74 which is close to the expected 3 to 1. The 439 animals in the last two matings yielded 208 negative to 231 rabbits with A agglutinins—well within the chance variation from the 219 expected. From the homozygous recessive mating 225 progeny were obtained. This includes 150 rabbits which belong to the Family I strain, Family I being a pure recessive stock. The deviations of the experimental from the theoretical ratios, although within chance error, have always been toward an excess of alpha animals. The significance of this is uncertain. A rare exception from the expected type of offspring could be theoretically possible due to mutation.

In the case of the human group B blood cell antigen, the situation is different. The B factor is a multiple antigen,[5] a part of which occurs in the erythrocytes of all rabbits. Consequently upon injection, antibodies could be produced in rabbits only against the B components not in the rabbit cell. Immunizations have shown,[6] however, that although all rabbits possessing normal B antibodies produce immune agglutinins, some but

TABLE 2

Inheritance of the M character

Genotype	*Normal Agglutinin*	*Immunizing Capacity*
M M	absent	+
M m	absent	+
m m	absent	—

Type of Mating	*Type of Progeny*	*Number of Progeny*	*Expected Ratio*	*Chi Square*
$\frac{M}{M} \times \frac{M}{M}$ or $\frac{M}{m}$	M	13	13	
	m	0	0	
$\frac{M}{m} \times \frac{M}{m}$	M	36	39.8	1.21
	m	17	13.2	
$\frac{M}{m} \times \frac{m}{m}$	M	13	11.5	0.37
	m	10	11.5	

not all individuals without the agglutinins also produce immune B antibodies. Furthermore, B antibodies in general are less easily produced than A agglutinins. If immunizing capacity for the B antigen is inherited it apparently is not by a simple mechanism but probably by multiple factors.

Another serological characteristic was studied—the ability to produce anti-M agglutinating sera. Instances cited in the literature showed that about 30 per cent of the rabbits that were immunized yielded suitable M typing fluids. Injections of animals from our stock showed considerable variation in response to the M antigen. A further series showed that the immunizing capacity was inherited [7] and, so far as the data went, inheritance could again be explained by a single pair of factors.

Table 2 summarizes the breeding data to date for the M character. In no case are normal specific M agglutinins present in the rabbit sera. With the M antigen, in contrast to the A, the ability to produce antibodies is the dominant (M) factor and only the homozygous recessive animal (mm) is incapable of forming M agglutinins. Progeny have been tested from three types of matings and, although the numbers are not great because of the long procedure needed to test each animal, the figures closely approximate the expected ratios for a simple Mendelian interpretation of inheritance. No progeny from the double recessive mating have been available for testing.* While the ability to produce M agglutinins definitely seems to be an inherited characteristic in rabbits, no final conclusions can be drawn until the double recessive mating has been made and until larger numbers of progeny have been tested.

The reason for the failure to produce M antibodies is not apparent. M antigen has not been conclusively demonstrated in the tissues of rabbits. It is not in the erythrocytes,[8] and in the few cases which we have examined we have not found it in the tissues. A serious difficulty in working with M and N agglutinins is nonspecific absorption. This seems to be overcome by the new technic of Kosjakov and Tribulev,[9] and possibly by this method M antigen will be demonstrated in the tissues of rabbits which fail to yield M antibodies.

* Mr. Sleeper has several litters of young rabbits which should be ready for testing within a few months.

Besides these studies with the human blood cell antigens a few additional facts have been noted in connection with the stock of rabbits, particularly with respect to Family I which is a strain of New Zealand whites, large (8–10 lb.) white rabbits which was started in 1932 with 3 sibs and now has been closely bred for 7 generations. Fifteen of these animals were tested by Dr. Landsteiner at Rockefeller Institute and consistently found to give considerably higher titers for Forssman antibodies than the stock commonly used. Another interesting fact was observed in connection with immunizations done at Brown University with coliform organisms. Because of shortage of Family I rabbits discarded animals from genetic experiments were used for most immunizations. With one culture attempts to produce agglutinins in 6 animals failed; the maximum agglutinin titer was 1:160. One Family I rabbit was used and after a short course of injections gave an agglutinin titer of 20,000.

For several reasons no attempt has been made to extend the studies to other antigens, bacterial or otherwise, but it seems likely that, possibly with a strain of the present stock, or by selection of animals and breeding to bring out the characteristic, strains of rabbits could be had that were especially suitable for specific immunological purposes. The Family I animals, for example, are excellent for the production of anti-A agglutinins or heterogenetic antibodies against the human A- or sheep cell antigens. Possibly this, or another strain would also prove particularly good for anti-pneumococcus sera, or antisera against the enteric organisms.

That the individuality of the rabbit is a factor in both the qualitative and quantitative aspects of antibody production should be borne in mind. While many factors such as length of immunization, route of injection, age and physical condition of the animal, etc., influence the reactive qualities of the serum produced, especially when complex cellular antigens are used, the "constitutionality" of the rabbit is important, and sometimes critical. We have shown that some of the "constitutional attributes" of the animal are inherited and probably in simple Mendelian fashion. Other serological characteristics also seem to be inherited although the manner of inheritance, at present, is not so apparent.

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Prevailing Employment Policies in Health Departments*

MARK V. ZIEGLER, M.D., AND GEORGIE S. BROCKETT
U. S. Public Health Service, Washington, D. C.

WITH the recent expansion in public health, the importance of definite policies in personnel management is being better recognized, and the point has been reached at which such scientific methods of selection and control are regarded as integral parts of the structure. Thus health officers, as public health executives having an administrative goal of efficient service, have come to realize the necessity for having a high quality of personnel to render the service. Unfortunately, however, they have not thoroughly realized the degree to which they are responsible for selection of the best available employees. Administrative policy is not only a primary factor in securing good employees, but it will go far toward shaping the attitudes and, to that extent, the efficiency of those in service.

Realizing this fact, the Conference of State and Territorial Health Officers requested the Public Health Service to assemble data on existing policies and methods of personnel handling in official health departments. Accordingly, in July 1938, the Public Health Service sent out a detailed questionnaire to each official state or city health department known to be in charge of a full-time executive. The purpose of this paper is to present an analysis of the data thus assembled.

SCOPE OF THE STUDY

The questionnaire requested details on the policies governing professional, scientific, and technical personnel with special reference to: (1) merit systems, (2) selection of prospective employees, (3) bases for promotion, (4) existence (and range) of graded salary scales, (5) retirement systems, and (6) annual leave, furloughs, and sick leave. Questionnaires were sent to 52 state and territorial health departments and 50 replies were received.† The response from cities was less complete; 50 of the 276 schedules sent out to cities having a population of 10,000 or over were not returned and an additional 23 incomplete replies were omitted from the analysis. The discussion that follows is based, therefore, on data from 46 states, the District of Columbia (herein treated as a state), and 203 cities.

MERIT SYSTEMS

Since a merit system is generally accepted as a most effective device to

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† Although replies were received from the territorial departments, they are not analyzed in this report, because of lack of comparability with states.

avoid the outstanding evils of the spoils system, the schedules from both state and city health departments were first considered according to the reported presence or absence of such a system in the department. In this study a health department is credited with a merit system if any full-time employee, paid directly from the department's funds, is employed on a merit basis.

TABLE 1

Proportion of Employees under a Merit System in Health Departments, Distributed According to Jurisdiction

Proportion of Employees Reported under Merit System	*Jurisdiction*			
	State		*City*	
	No.	*Per cent*	*No.*	*Per cent*
All or some part	18	38.3	126	62.1
All	2	4.3	65	32.0
All except H. O.	11	23.4	29	14.3
Part, excluding classes or individuals	5	10.6	32	15.8
None	29	61.7	77	37.9
Total	47	100.0	203	100.0

In Table 1 it is seen that three-eighths of the state departments and five-eighths of the city health departments operate under some form of merit program, although in only 2 states, and fewer than one-third of the cities, are all personnel in the department affected. While no one would call this an impressive showing, it does indicate the extent to which the policy of having all personnel under merit regulation has been adopted.

It should be pointed out that one-third of both the state and the city departments reporting merit programs omit one or more groups or individual employees from the regulations and that the health officer is specifically exempted alone in 11 states and one-seventh of all the cities. Investigation of the group of departments with merit systems that leave out employees other than the health officer, however, reveals no consistent pattern of exemption. In some jurisdictions several types of employees are left out of the system; in others, only one. For example, among jurisdictions claiming merit systems, 1 out of 6 exempts all or part of its full-time staff physicians; 1 in 12, nurses; 1 in 10, nursing supervisors.

Though the merit system is accepted as the means by which a career service for public personnel can be maintained, the data indicate that much remains to be done before public health can point to a career personnel employed on a merit basis.

PERSONNEL SELECTION

Not only is selection of competent employees a primary function of good personnel administration; but the quality of employees selected determines the future efficiency of the health organization. Lacking capable personnel, no amount of administrative ingenuity can produce effective service; but with high caliber personnel the lightened routine load increases the executive's opportunity for leadership.

What methods are used to select employees? It should be borne in mind that, inasmuch as a given department may use more than one method or a combination of several selection devices for different types of personnel, there is no clear-cut way of grouping jurisdictions in mutually exclusive single categories. However, it has been pos-

sible to set up classifications into which departments fit according to the degree of freedom from partisanship afforded by the devices or methods they use to choose new employees. Each department having known methods of personnel selection may be classified according to the following categories of requirements for employment: (a) examination regardless of other requirements, (b) eligibility on a list but no examination, (c) specified qualifications as to experience and training but no examination or eligible list, (d) recommendations only or recommendations and interview, and (e) only an interview.

Table 2 distributes departments according to these categories and shows the breakdowns by jurisdiction and presence or absence of a merit system. One-third of the states and more than half the cities report that some part of the health department staff is selected by examination, the most prevalent of all the devices listed. The data, on more detailed analysis, however, showed only one-fifth of the states and one-third of the cities as using this method for all employees even if the health administrator is left out of consideration entirely. Although the technic of examination enters most frequently into the process of selection, almost the same number of states and half the number of cities that use this method depend solely upon an interview for such selection as they make.

Less widely used is the procedure of interviewing those on an established list of eligibles. Next to the examination, this is perhaps the method allowing least opportunity for partisan politics or personal favoritism, provided the preparation of the eligible list is adequately protected. Our data furnished no evidence on this point. Small groups of jurisdictions require (a) specified qualifications as to education and training (such as the minimum standard set up by the State and Territorial Health Officers); or (b) references or recommendations from former schools, former employers, state medical associations, nursing societies, state health departments, or reputable citizens. The latter requirement occurs most frequently among city departments without merit systems and is open to the objection that, while it may offer some protection against selection of incompetent personnel, it also furnishes opportunity for the exertion of political pressure.

TABLE 2

Methods of Personnel Selection in Health Departments, by Jurisdiction and Existence of Merit System

			Health Departments According to							
	Total Departments Reporting		Jurisdiction				Merit System			
			State		City		With		Without	
Method of Personnel Selection	No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent
Examination, required for all or part of employees	121	48.4	15	31.9	106	52.2	117	81.2	4	3.8
Interview, eligible list	15	6.0	5	10.6	10	4.9	4	2.8	11	10.4
Specified qualifications required	14	5.6	7	14.9	7	3.5	1	0.7	13	12.2
Recommendation required	28	11.2	5	10.6	23	11.3	8	5.6	20	18.9
Interview, not otherwise specified	66	26.4	13	27.7	53	26.1	11	7.6	55	51.9
Unknown	6	2.4	2	4.3	4	2.0	3	2.1	3	2.8
Total	250	100.0	47	100.0	203	100.0	144	100.0	106	100.0

It is obvious from Table 2 that, with the adoption of a merit system, comes a decided drift toward examination as a selective device. It will be observed that four-fifths of all jurisdictions claiming merit systems also use examinations, a proportion twenty times as great as is found among jurisdictions without such systems. Furthermore, breaking down the examination group to determine the personnel classes affected, discloses that, among merit system departments using this technic 3 out of 8 apply it to all employees, while no department without a merit system uses an examination for selection of all employees.

Failure to use examination more widely as a selection device may be explained partly by the large number of small city units which would find it difficult to finance a comprehensive testing program. Certain steps have been and are now being taken to overcome this difficulty. In some states the state personnel agency renders technical and administrative services to the local agencies. In one state the cities and counties may contract with others having a merit system in operation or with the state personnel board for examinations for employees.

Furthermore, a movement now in progress would set up standard job qualifications for positions common to the federal, state, and county governments and make the list of eligibles equally accessible to each. For example, an examination acceptable to the three types of jurisdictions might be devised and given to nurses, and the list of eligibles then made available to all three units. This method, when perfected, should do much to prevent duplication of effort in personnel selection and save money now spent in such wasteful practice.

BASES FOR PROMOTION

Having selected and employed a competent staff, the executive finds policies for keeping up their morale assuming paramount importance. The single most effective means of keeping employee morale at a high level is fair compensation for service rendered, including not only a fair starting salary with the prospect of promotions in grade and increases in salary; but also annual and sick leave as a matter of right and a retirement plan.

No one has yet discovered an ideal formula on which to base promotions. It is conceded, however, that proficiency and length of service are two desirable elements in any formula of promotion; and it is doubtful that adding "at the judgment or discretion of the administrator" to this prescription is wise, notwithstanding the fact that most administrators feel the need of it to maintain control. Inspection of Table 3, however, will make it apparent that promotions either are left entirely in the administrator's hands or are limited by his judgment in more than three-fifths of the states and about two-fifths of the cities. The power to promote is usually held by the health officer; although in some cases the Board of Health or a city official is listed as having that power. Such a policy certainly affords opportunity for personal favoritism and political exploitation, even though the opportunity may not be utilized. In any case, it is to be deplored that the administrator's discretion is thus firmly entrenched as the dominating factor in promotions.

Next in importance as a basis for advancement is proficiency, listed by about three-fifths of the states and more than one-third of the cities, counting all cases in which it is the sole basis, as well as those in which it is only one factor to be considered. Since a promotion policy based on proficiency alone, or as the major basis for promotion, raises the morale of the staff and the standard of work, it is to be encouraged and commended by those

TABLE 3

Bases Used for Promotion of Employees in Health Departments, by Jurisdiction and Merit System

Basis Used for Promotion of Employees	Total		Jurisdiction: State						Jurisdiction: City					
			Number			Percentage			Number			Percentage		
	No.	Per cent	Total	Merit System	No Merit System	Total	Merit System	No Merit System	Total	Merit System	No Merit System	Total	Merit System	No Merit System
Automatic, length of service	8	3.2	1	1	..	2.1	5.5	...	7	4	3	3.4	3.1	3.9
Blanket increase	4	1.6	..	..	..	...	...	...	4	3	1	2.0	2.4	1.3
Administrator's disc.	57	22.8	14	3	11	29.8	16.7	37.9	43	23	20	21.2	18.3	26.0
Administrator's discretion and proficiency	46	18.4	15	6	9	31.9	33.3	31.0	31	17	14	15.3	13.5	18.2
Proficiency (alone)	36	14.4	6	4	2	12.8	22.2	6.9	30	25	5	14.8	19.8	6.5
Combinations of above bases	19	7.6	*6	3	3	12.8	16.7	10.4	†13	8	5	6.4	6.4	6.5
None provided for	21	8.4	1	1	..	2.1	5.6	...	20	9	11	9.8	7.1	14.3
Unknown	59	23.6	4	..	4	8.5	...	13.8	55	37	18	27.1	29.4	23.3
Total	250	100.0	47	18	29	100.0	100.0	100.0	203	126	77	100.0	100.0	100.0

* Proficiency included in all combinations.

† Proficiency was a factor in promotions in 9 departments (4.4 per cent); 6 departments (4.8 per cent) of those with and 3 (3.9 per cent) of those without merit regulations. Administrator's discretion was a factor in promotion in 4 departments (2.0 per cent); 2 (1.6 per cent) of those with and 2 (2.6 per cent) of those without merit regulations.

concerned with professional advancement. Not unexpectedly, such a policy is found oftener among jurisdictions with merit systems than among those without them. Conversely, state and city departments without merit systems more often leave staff promotions to the discretion of the health officer than do those with such systems. This may be due to the lack of machinery for applying proficiency ratings or other criteria.

Length of service as the only basis for promotion is used in a few departments; and it occurs as a limiting factor in a few more. Obviously length of service as a sole basis for advancement is not advocated, but for the sake of staff morale, it might well be given some consideration so long as it does not tend to work to the advantage of incompetent employees.

Various combinations of method were found in 10 per cent of the departments studied but no uniformity of pattern is apparent. For example, in some jurisdictions all employees are promoted at the health officer's discretion, except nurses who take "promotional examinations" or are "promoted as vacancies occur." Some departments pay flat salaries to their health officers, physicians, dentists, and nursing supervisors; but raise salaries of other types of personnel according to length of service. These departments say frankly that employees holding the more responsible positions have no opportunity for promotion. If no provision is made for turnover, such a policy can only result in professional stagnation. A few departments have no plan for promotion for any employee; a few others use only blanket increases.

In calling attention to the fact that a number of departments do not provide for staff promotions, budget limitations have not been overlooked. However, the claim that "It is fixed in the budget" or "We asked for it but it was

cut out of the budget" is too often a mere excuse produced by glib, if not zealous, administrators. If such an executive misses his opportunity to secure funds for his staff, the whole department and the public both suffer. It is the administrator's responsibility to urge this vital part of his program before the budget comes up for consideration by the appropriations committee. He must marshal the facts showing the necessity for promotions in time to win coöperation and before the pressure on the committee by other departments is too great. Administrators who overcome these difficulties give their employees a goal toward which to work. On the other hand, perhaps no one factor in personnel direction is more likely to reduce the morale of a staff than absence of opportunity for advancement.

ANNUAL AND SICK LEAVE WITH PAY

In order to continue to put forth his best efforts, an employee must be granted sufficient time off the job, with pay, to insure recuperation from the yearly grind. It is equally important to efficiency that he shall not be unduly penalized by illness. A liberal and definite policy regarding leave is, therefore, an administrative safeguard against employee fatigue, staleness, and dissatisfaction. Table 4 summarizes the current policies in regard to the granting of both annual and sick leave. It will be noted that, although over one-sixth of the departments either make no provision at all or make only an indefinite one, 2 weeks' annual leave is granted in a majority of the departments, and almost one-fifth of them grant 15 to 30 days. It seems significant that jurisdictions with a merit system grant more leave than do those without such a system.

Policies regarding annual leave are not uniform within departments in approximately 10 per cent of the cases. The following typical leave regulations will serve to illustrate the point:

1. Fourteen days for all except supervisor of nurses and nurses, who get 30 days
2. Twelve days for all except laboratory technician, who gets 26 days (a state department)
3. Two weeks for inspector and laboratory technician, 4 weeks for nurses
4. One month for bureau chiefs, 3 weeks for nurses, 2 weeks for others

TABLE 4

Regulations Governing Annual and Sick Leave in Health Departments, Distributed According to Existence of Merit System

Leave Regulations	*All Departments Reporting*		*Merit System*		*No Merit System*	
	No.	*Per cent*	*No.*	*Per cent*	*No.*	*Per cent*
Annual, with pay						
1 week	2	0.8	1	0.7	1	1.0
10–14 days	159	63.6	87	60.4	72	67.9
15–30 days	43	17.2	32	22.2	11	10.4
No provision or unknown *	46	18.4	24	16.7	22	20.7
Sick, with pay						
1 week	8	3.2	5	3.5	3	2.8
10–14 days	61	24.4	34	23.6	27	25.5
15 days	14	5.6	9	6.3	5	4.7
3 weeks and over	25	10.0	20	13.9	5	4.7
No provision or unknown *	142	56.8	76	52.7	66	62.3
Total	250	100.0	144	100.0	106	100.0

* Includes those not specifying time, although in practice leave is granted.

In cases such as these, the department has been classified according to the policy followed for the majority of the employees, which is usually the nursing group.

Regulations about sick leave are not even so definite as those about annual leave, and provision for a fixed amount is made in only three-eighths of the cities and two-thirds of the states. Eight cities grant only 1 week of sick leave. Taking into account only the departments reporting a definite policy, it is apparent that the tendency is to grant 10 to 14 days of sick leave with pay. Here again the influence of the merit system appears to be toward a more liberal leave policy. In one city employees under the merit system may have 30 days' sick leave but those not in the system are not provided for at all.

A few departments grant sick leave for periods ranging from 1 to 3 months; others grant it according to length of service with the department. For example, one large city department grants 12 days a year which may accumulate to 150 days. Some organizations permit an employee to take sick leave with pay only until it is found necessary to employ a substitute, after which he receives no further pay until he returns to duty. This very unjust and vicious procedure penalizes the employee whose services are indispensable, while it favors the employee whose services are of relatively less value!

RETIREMENT PROGRAMS

Another factor contributing to morale and to an efficiently operating service is the existence of a retirement program. Such a program has values for both the department and the employee. First, from the department's point of view, it makes possible the separation of employees who might otherwise be retained through sympathy, even though superannuated or disabled; and second, by stimulating turnover in personnel, it attracts younger men in search of a career and keeps them during the period of their greatest usefulness. Third, it affords the employee security, an advantage both to him and to the department interested in efficiency.

Table 5 gives some idea of the problem ahead if we plan to attain such a goal. With 70 per cent of the state departments and more than 50 per cent of the city departments having no retirement system, the outlook is not promising. No help can be obtained from the Social Security Act as it now stands, inasmuch as it specifically excludes public employees from any participation in its benefits. Whether or not we should seek inclusion under this

TABLE 5

Retirement Systems in Health Departments, Distributed According to Jurisdiction and Merit System

Retirement System in Operation	All Departments Reporting		Jurisdiction: State						Jurisdiction: City					
			Total		Merit System		No Merit System		Total		Merit System		No Merit System	
	No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent
Yes	91	36.4	13	27.7	10	55.6	3	10.4	78	38.4	67	53.2	11	14.3
No	138	55.2	33	70.2	8	44.4	25	86.2	105	51.7	46	36.5	59	76.6
Yes, but membership optional	2	0.8	..		..		..		2	1.0	1	0.8	1	1.3
Unknown	19	7.6	1	2.1	..		1	3.4	18	8.9	12	9.5	6	7.8
Total	250	100.0	47	100.0	18	100.0	29	100.0	203	100.0	126	100.0	77	100.0

Act or try to set up state or state and local retirement systems is another question for administrators to decide. It is of some encouragement to note that more than half the departments with merit systems also have retirement programs.

CONCLUSIONS

Leaders in the field of personnel administration know that high staff morale is the best assurance of effective public service. To strengthen morale they recommend establishing merit systems that will provide scientific bases for promotion, opportunity for advancement within the service, a reasonable amount of annual and sick leave with pay, and an adequate retirement program.

Data bearing on the present status of 250 health departments, with respect to these policies may be summarized as follows:

1. Sixty-two per cent of the states and 38 per cent of the departments in cities have no merit system for public health personnel.
2. Health administrators and staff physicians are most frequently exempt from the merit system.
3. The presence of a merit system tends to:
 a. promote the use of examinations as a method of selection
 b. Develop a program for personnel promotion free from political pressure
 c. Increase the proportion of departments claiming "proficiency" as a basis for promotion
 d. Increase the amount of annual and sick leave allowed
 e. Encourage the use of a retirement plan

These findings point to the fact that merit systems bring about the very things that build staff morale, and lead to more efficient work. It is, therefore, clear that if we, as public health administrators, are to attain the maximum service from our staffs, we must exert every effort toward the extension and improvement of merit systems.

Use of Ferrets in Laboratory Work and Research Investigations*

NORMAN J. PYLE, V.M.D.

Assistant Director, Veterinary Department, Lederle Laboratories, Inc., Pearl River, N. Y.

THE ferret is a member of the weasel family, *Mustelidae,* to which belong the polecat, stoat, martin, mink, and weasel. All are characterized by a fetid odor, but this is not marked in the ferret. It is further classified as a member of the genus *Mustela,* and the sub-genus *Putorius,* var. *furo.*

It is generally assumed that the domesticated ferret is an albino breed derived from the wild polecat (*Putorius foetidus*), but it differs from the latter principally in the yellowish-white color of its fur and the pink-red color of its eyes. This is commonly known as the "English" ferret.

The North American, or black-footed ferret (*Mustela nigripes*),[1] has a pale buff, or yellow, fur with a sprinkling of dark brown hairs on the back. The under parts are buff, or cream-colored; the feet, black, or dark brown; there usually is a broad, black band across the eyes; the tail is short and colored like the body, except for a short, black tip. This species is commonly referred to as the brown or fitch ferret.

During the past 12 or 13 years, the ferret has become increasingly important as a laboratory animal, particularly for virus research. Since it was first shown by Dunkin and Laidlaw[2] to be susceptible to canine distemper, it has been used to great advantage in the study of several other virus infections.

While it is the purpose of this paper to review published and unpublished data pertaining to the use of the ferret in laboratory investigations, certain limitations prevent a complete summary at this time. The comparative newness of the species as a laboratory animal, and its limited use in this respect, explain, perhaps, why there exists a paucity of data with regard to its anatomy, physiology, endocrinology, and nutritive requirements. It is hoped that this report will stimulate further investigations along these lines.

ANATOMY

For laboratory purposes, there is little demand for ferrets of definite weights; although in general an adult animal is usually desired. In using the term "adult," the breeder invariably refers to an animal 4 months of age or older. However, at this age, the ferret has not attained its full weight and growth.

Several strains have been developed for specific purposes. By selective breeding, large ferrets have been produced for rabbit and woodchuck hunting; smaller strains have served admirably for rat extermination work. There is a tendency now on the part of breeders to concentrate on the produc-

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tion of smaller animals for laboratory purposes, since this use of the ferret in recent years has completely revolutionized the industry.

The brown or fitch ferret, more regularly used in our work, will average 1,363 grams in the male at approximately 15 months, and 997 grams in the female at the same age.

The lungs are a delicate pink color in the normal state, and occasionally may show small, flat, but slightly raised, yellowish-white areas on the surface. Dunkin and Laidlaw [2] were of the opinion that these markings were lesions seen in about one-third of their cases of ferret distemper. However, we, like Shope,[3] have observed them at times in normal ferrets.

Little can be said at this time regarding the arterial and venous systems other than to note that the carotid artery and jugular vein are prominent and readily accessible.

In three brown males, bled from the ear, Slanetz [4] reports an average red cell blood count of 9,810,000 per cu. mm. His white cell counts varied from 7,120 to 21,600 per cu. mm. in four trials, the highest being found in a female.

In our similar number of counts on bloods from normal ferrets, 15 months of age, taken by cardiac puncture, the following averages were obtained:

Red blood cells	8,500,000 per cu. mm.
White blood cells	8,900 per cu. mm.
Hemoglobin	84 per cent
Polymorphonuclears	65 per cent
Lymphocytes	33 per cent
Monocytes	1 per cent
Basophiles	none
Eosinophiles	1 per cent
Young forms	9 per cent

In comparison with the 7.5–8 microns diameter of the human red blood cell, that of the ferret appears to be about 5 microns.

PHYSIOLOGY

Little is known regarding some of the physiologic processes of the ferret. Data on urine, its specific gravity, reactions, and normal constituents are nil. Not much more is recorded on blood chemistry. It is hoped that such information can be made available to laboratory workers later.

Temperature—The normal range of the rectal temperature is from 101.0° F. to 102.5° F. However, even the mildest type of restraint exercised while taking the temperature will cause its rise to as high as 104.0° F. It is always advisable, before starting critical experiments involving accurate temperature readings, to accustom the animal to the introduction of the thermometer into the rectum, by taking the temperature twice daily for several days. The thermometer should be small and well lubricated if peri-anal inflammation is to be avoided.

Respiration—This ranges between 33 and 36 per minute in the normal ferret.

Pulse—No information is available on the pulse rate. However, it is so rapid that data will have to be obtained through kymographic readings.

Blood Chemistry — Our superficial studies would indicate that normal ferret blood contains 131 mg. of sugar per 100 cc., 7.2 mg. of calcium per 100 cc. and 41.3 mg. of N.P.N. per 100 cc. This work is being continued.

Temperature Requirements — Under ordinary conditions, the ferret is a hardy animal and is able to withstand exceedingly low temperatures. It suffers somewhat, however, during extremely hot weather. At these times, if the animals are quartered inside, means should be provided for circulating the air in the animal house. No difficulty is experienced in keeping them outside even during severe winter months, provided they are housed in adequate pens.

Period of Oestrum—Information obtained from several breeders indicates that the female ferret, under conditions of climate prevalent in the East and Middle West, will come into season for the first time early in March of the year

following birth. Carnochan [5] is of the opinion that oestrum occurs fully a month earlier in some parts of the West, particularly in California.

Provided the female ferret, or jill, as it is called, is bred and gives birth to a litter, a second oestral period will usually occur in July, although there are cases in which this second period occurred as late as the middle of August. According to Hammond and Marshall,[6] oestrum persists in the ferret in the absence of coitus for as long as 5 months in some cases. Under such conditions, the animal gradually becomes emaciated and debilitation may lead to death. At least, the possibility of a second litter from such an animal during the same year becomes nil.

These investigators also point out that ovulation may take place at any time during oestrum, but only after coitus. If fertilization does not occur, false pregnancy arises and all evidences of oestrum disappear.

No difficulty is experienced in detecting the presence of oestrum. The vulva enlarges to a considerable degree and persists at such an increased size throughout the period, but is reduced to its anoestrum size as soon as pregnancy takes place.

Mating — Hammond and Walton [7] state that the average duration of coitus is about 2 hours, but it may vary between 15 minutes and 3 hours. American breeders, however, customarily place the male with the female for 24 hours early in the oestral period. These workers also determined that ovulation takes place in the female about 30 hours after coitus.

Period of Gestation—This is normally 42 days.

Size of Litters—The average size of the litter raised in this country is from 6 to 8, although occasionally there may be as many as 10 or 12. Two litters are born annually, one in May and one in September.

Development of Young at Birth—When born, the members of a litter are hairless and blind. Each will weigh approximately 10 grams.

CARE OF YOUNG—FEED REQUIREMENTS

Approximately 10 days before the litter is due, the nest box (described later) is loosely filled with wheat straw, or similar material, and pressed down in the center to form a nest. Such a box is provided for each pregnant female and her litter. As the time for parturition approaches, the mother will further prepare the nest by lining it with body hair. After the young ones are born, she prepares additional protection by pulling down over them the excess straw in the nest box.

Observations of the young should be made occasionally after the first few days following birth. It is best to do this when the mother has left the nest box to feed. If the litter is large, it is sometimes advisable to remove all over 6 of the litter and place them with a foster mother during the suckling period. In order to avoid a common condition in the nest box referred to as "sweats" by the breeders, the straw must be kept dry and periodically removed from overtop of the young ferrets. The mother insists on keeping her litter covered in this manner. Young ferrets so affected "sweat" to such an extent that their bodies become quite moist. Scours usually accompanies the condition.

The young open their eyes at about 4 weeks of age, when they can be fed for the first time. While still in the nest, they may be given a little bread soaked in milk. Occasionally, finely chopped meat can be added to this diet.

While suckling, the mother should be supplied plentifully with whole milk and bread. Small amounts of meat are also given daily.

For a short time after weaning, the young ferrets are fed thrice daily; later,

twice daily. Milk, bread, and meat are given in quantities just enough to satisfy each individual. Overfeeding is to be avoided.

Diets recommended for grown ferrets are varied, but all seem to serve their purpose. Raw meat only, once daily, seems to be quite satisfactory, but milk, diluted 50 per cent with water, should be added to such a diet. The majority of the breeders insist that all salt should be eliminated from the diet, but 0.5 to 1 per cent has been used in some of the rations without harm to the ferrets.

We have been quite successful in feeding a mush made from whole wheat flour and water. This is made in bulk for storage, without adding salt, and mixed with milk for each day's feeding.

Just enough is given once daily as will be cleaned up completely by the animal. In addition, about 4 ounces of horse meat per animal is given two or three times a week.

HANDLING

Cages—For all practical purposes under laboratory conditions, cages similar to those used for rabbits are quite satisfactory. These are made preferably of metal and are 18 inches wide, 22 inches long, and 14 inches high. The bottom is solid. All sides and the top, of a hinged or slip-on type, are made of heavy, ½ inch mesh wire. Wood-shavings, preferably cedar, are used as litter. Feed cups are suspended from the sides of the cage.

The ferret is an unusually clean animal and habitually deposits its excretions in one corner of the cage. Although it is often not necessary, the litter is removed and replaced every 2 days. The cage itself is thoroughly cleansed and steam-sterilized every week. This type of cage is used to house a single ferret on experiment, but can be used for two normal ferrets being held in reserve for subsequent use.

These cages, when they contain ferrets on experiment, should be kept widely separated. If placed side by side, infection can be spread readily from cage to cage through the open mesh work of the sides by the droplet mode of transmission. Much discouragement and wasted effort can be avoided by using an isolated room containing completely walled-in cubicles, one for each cage, when ferrets are being used in the study of a highly communicable infection.

For long-term experiments, we much prefer a more elaborate cage with an exercising run and a housing compartment containing a nest box. These are kept outdoors in a shaded area during the hot summer months. Even in extremely cold weather, the ferrets do much better in such pens than when quartered indoors. This type of cage is also ideal for breeding ferrets.

The exercise run is 24 inches wide, 24 inches high and 36 inches long. The bottom, sides, and top are of heavy, ½ inch mesh wire. One end, which may be called the rear of the complete unit, is made of tongue-grooved boards with hinges on the bottom so that it can be opened to permit feeding as well as cleaning the wire run. The housing compartment at the front of the unit is an integral part of the exercise run, and is separated from it by a board partition, at the bottom and to the side of which is a hole 4 inches in diameter to permit the ferret to pass from the compartment to the run. Over this hole in the partition is a sliding door made of thin metal. This can be opened or closed from the outside of the unit by a push rod.

The floor of the housing compartment is 24 inches square. The front is 18 inches high, 6 inches lower than the back (partition separating it from the exercising run). The roof lifts up on hinges and slopes from the rear downward to the front. The bottom, walls, and hinged roof are made of wood.

Roofing paper protects this part of the unit from rain and snow.

Inside the housing compartment is placed the nest box, made of wood, with a hinged top, into which are bored about 12 holes for ventilation purposes. The box is 13 inches long, 13 inches wide and 12 inches high. At one end, a hole, 4 inches in diameter, permits the ferret to leave or enter the box. Wood-shavings are used as bedding both on the floor of the compartment and in the nest box. During warm weather, the ferret uses the compartment. In cold winter weather, it seeks more adequate protection in the nest box.

Restraint—As a rule, it is not difficult to restrain ferrets, despite their viciousness and tendency to bite upon the least provocation. Some workers and breeders insist on using heavy rubber mittens to protect their hands and fingers. These are cumbersome and really unnecessary. It is only the occasional ferret that cannot be handled with ordinary care.

The first step in restraining the animal is to grasp it quickly by the tail with the right hand when its back is turned. This should not be attempted until the ferret's attention is attracted to something in front of it. The animal is remarkably quick and agile and can turn upon itself and "sink" its canine teeth into the offending fingers. Should this occur, the hold on the animal must be released. The ferret will then reciprocate. As long as an attempt is made to continue the restraint, the animal will hold on with its sharp teeth and cause an ugly, lacerated wound. These have never become infected in our experience and always heal by first intention.

As soon as the tail is grasped with the right hand, the ferret is lifted from the cage. While still holding the tail, it is placed on top of the cage with its fore legs over the side. In this position, it is able to obtain a degree of anchorage with the fore legs and pull against the restraining hand. While its attention is diverted in this direction, it is grasped quickly, with one swift motion, encircling the neck immediately back of the ears, by the first and second fingers of the left hand. Then, with the thumb and all fingers of the left hand, while the original position is maintained, the fore legs can be grasped and restrained. The hold on the tail is released by the right hand, which is then used to grasp firmly the hind quarters and legs. When restrained in this manner, almost anything can be done with the animal. The rectal temperature can be taken, inoculation by various routes can be accomplished, and even a cardiac puncture is possible; although, in the latter case, it is well to place the animal under light ether anesthesia.

Ether can be administered by a small cone while the animal is restrained as described. It is more practicable, however, to place the ferret under a bell jar on a desiccator plate (with legs), under which there is cotton saturated with ether.

When it is necessary to pass a stomach tube, the ferret is restrained as previously described and held up by the left hand encircling the neck and fore legs with the muzzle facing an assistant. A piece of ½ inch dowling, with a hole ¼ inch in diameter bored through it, is manipulated into place by the assistant between the upper and lower teeth. A small catheter is then inserted through the hole in the dowling and slowly and carefully passed down into the stomach. This procedure is used to administer the full dosage of a drug directly into the stomach. The drug to be given is forced into the catheter from a syringe.

COMMON NATURAL DISEASES OF THE FERRET

Without question, the most serious natural infection of the ferret is that

caused by the virus of distemper. The disease has an unusually high mortality. On two occasions, we have lost all individuals in our reserve stock through contact infection. We now avoid holding a large reserve stock and have contract agreements with a breeder to forward fortnightly shipments throughout the year. All incoming ferrets are quarantined for 10 days, during which period any incubating infection that might be brought in with them will develop.

For a complete and detailed description of distemper in the ferret, we refer to the report of Dunkin and Laidlaw.[2] Treatment is unsatisfactory.

Constant attention must be given to the prevention of "foot-rot," which is caused by a mange mite. Damp and filthy litter in the cages and nest boxes favor its development. The appearance of swollen feet, covered with scabs, calls for immediate treatment, which is quite satisfactory if started early. Some breeders use a kerosene dip. Carnochan[5] claims unfailing success by applying xylol to the affected parts after removal of the scabs with forceps. Two treatments are given at an interval of 3 days, after which Danish ointment is applied every few days. He also advises lightly dusting of the bedding with flowers of sulphur. This also acts as a flea repellent.

Scabies sometimes appears on the tail and over the back. This can be treated similarly, or with sulphur ointment. Ear canker, while not common, occurs. Ear drops containing liquid petrolatum, phenol and tannic acid are used in these cases.

Closely akin, if not identical with distemper, is another virus infection of ferrets studied by Slanetz and Smetana[8] in October, 1934, after it occurred epizoötically in their colony of ferrets. The disease was essentially respiratory and was complicated by a secondarily invading hemolytic streptococcus. Cytoplasmic and intranuclear cell inclusions in the epithelial cells of certain organs were indistinguishable from those occurring in canine distemper. While these authors were unable to demonstrate any immunological relationship between the virus of this ferret disease and the viruses of canine distemper and human influenza, we (unpublished data) succeeded in immunizing a relatively large group of ferrets against definitely known canine distemper virus with a formalinized vaccine supplied us by them, and which was composed of infected lung tissue obtained from ferrets dead of the virus infection in question. It would appear, therefore, that this virus was at least a variant of the common distemper strain.

Subsequently, in 1935, Spooner[9] apparently studied the same disease as it occurred among breeders' stocks of ferrets. It was his opinion that he was dealing with a form of distemper antigenically related to dog distemper, since his results differed only in minor points from the description of canine distemper in the ferret given by Dunkin and Laidlaw.[2]

Ferrets are also subject to "boils," which occur in the neck region and often involve the salivary glands. A variety of organisms have been isolated from these, the most common of which has been *Staphylococcus aureus*. In some quarters, it is presumed to be introduced through the feed.

A nonspecific pneumonia sometimes takes its toll in ferretries, but there is evidence that in some cases, at least, it is due to hemolytic streptococcic infection precipitated by one or more debilitating factors. Brightman[10] recovered this organism from the lung and heart blood of ferrets reacting to intranasal instillation of bacteriologically free tissue suspensions containing influenza virus. He concluded that the streptococcus was of ferret origin and

that it belonged to Group C of the Lancefield classification.

It has been the experience of Francis and MaGill [11] that some ferrets, during the winter months in particular, are carriers of hemolytic streptococci, or small Gram-negative bacilli, in the respiratory tract. A purulent rhinitis occurs sometimes. Similar observations have been made in our laboratories.

Several species of internal parasites may find the ferret a suitable host. As parasitic infections in this animal are rather uncommon, and even rare, space and time will not be given to their description. For detailed information, Mönnig's [12] text on helminthology may be referred to.

ARTIFICIAL INFECTIONS

Since the report of Laidlaw and Dunkin [13] of the results of studies on the immunization of ferrets against canine distemper, these animals have been used widely in further investigations on this disease. References are too numerous to mention here; however, brief statements will be given regarding two recent reports.

DeMonbreun [14] meticulously studied the histopathology and cytology produced by the virus and found them similar in dogs and ferrets. Dochez and Slanetz [15] used the animal to a limited extent in investigating the effect of sodium sulfanilyl sulfanilate in the treatment of canine distemper.

Distemper in the ferret can be induced very readily by exposure to contact infection and by intradermal, subcutaneous, intramuscular, intraperitoneal, intracerebral, and intranasal inoculation.

References to the use of the ferret in studies on human influenza virus are also legion. Smith, Andrewes, and Laidlaw [16] were the first to attempt the artificial infection of various laboratory animals with filtrates of throat washings. The results were negative until the ferret was used. A full description of the symptoms and pathology is given in the report of these investigators.

After the intranasal instillation of egg-influenza virus, Burnet [17] found that ferrets usually showed no symptoms or temperature rise, but such inoculation induced a high grade immunity. Francis and MaGill [11] found that influenza-immune ferrets may be encountered among stock animals not infected experimentally. They were unable to state whether or not this developed as a result of contact of human origin.

Several investigators have also used the ferret in studies on swine influenza. Smith, Andrewes, and Laidlaw [16] observed that these animals, when inoculated with virus obtained from Shope, gave rise to a disease indistinguishable from the infection caused by the human virus. Later, Shope [18] confirmed this observation and showed that after 16 serial transfers of the swine influenza virus in ferrets there was no alteration of its pathogenicity for swine. With virus emulsions from ferrets suffering from influenzal attacks caused by either human or swine virus, Laidlaw, Smith, and Andrewes [19] were able to produce a hyperimmune serum of significant potency in horses.

The literature on the use of the ferret in researches conducted on the common cold is practically nil. However, in a limited trial, Smith, Andrewes, and Laidlaw [16] failed to infect them with nasal secretions from a subject suffering from a severe common cold. There is reason to believe that more conclusive data of this nature are available, but not published.

There are a number of other infections, less extensively studied, in which the ferret has been used. Francis and MaGill [20] recovered the virus of Rift Valley fever from the respiratory tract of three human patients and transmitted it to ferrets by intranasal instillation.

The experimental disease in these animals was characterized by fever, pulmonary lesions, and hemorrhagic phenomena.

These same workers, Francis and MaGill,[21] were able to infect ferrets consistently with an unidentified virus obtained from human patients suffering from an epidemic disease similar to influenza. By the intranasal route, it produced extensive, fatal pneumonic lesions. By the subcutaneous route, it produced local granulomatous induration of the skin with enlargement of the regional lymph nodes. The investigators tentatively named the virus that of acute meningo-pneumonitis. Later, Stokes, Reimann, and Shaw [22] reported the isolation of a comparable agent from a human patient, the secretions of which produced a comatose state in 24 hours after intranasal instillation in a ferret.

Recently, Dalldorf [23] has observed that the ferret is susceptible to a symptomless form of infection caused by the virus of lymphocytic choriomeningitis. Virus may be demonstrated in the brain, spleen, liver, and blood, and intranuclear inclusion bodies are found in the cortex of the adrenals.

While working with Swiss mice on human influenza studies, Dochez, Mills, and Mulliken [24] encountered a virus prevalent in three different sources of supply. The infection was characterized by pulmonary lesions with high mortality after several passages through additional mice. This mouse virus in the form of lung suspension, when inoculated intranasally into ferrets, produced a sharp, early rise in temperature to about 105° F. This was occasionally followed by a second rise. Respiratory symptoms were sometimes seen, but the transmitted infection did not prove fatal. Subcutaneous and intraperitoneal inoculation did not result in infection.

In general, the ferret is susceptible to a number of viruses when the inoculum is introduced intranasally. Other routes of inoculation, as a rule, fail to produce clinical manifestations. However, in the case of the virus of fowl pest (not present in this country), Findlay and MacKenzie [25] were able to infect the ferret by intraperitoneal and intracerebral inoculation, as well as by intranasal instillation. The virus was distributed in the brain, liver, and spleen, regardless of the route of administration.

METHODS OF INOCULATION

The ferret is amenable to all common routes of inoculation, but as indicated previously, intranasal instillation is most frequently used. This is best performed while the animal is under light ether anesthesia. If it is attempted under ordinary restraint, the animal's sneeze reflex causes considerable difficulty, making it impossible to administer a graded dose.

After the animal has been anesthetized (lightly), Shope [18] uses a 2 cc. syringe, without needle, and applies the blunt tip of the syringe to the external nares. A small amount of the inoculum is expressed from the syringe each time the animal inspires. In this manner, the required dose may be given without the loss which occurs when the ferret sneezes. A graduated pipette serves the same purpose and permits the instillation of a drop of the inoculum at a time. Ferrets so inoculated usually react with a more severe type of the transmitted infection than when not anesthetized. This is true, particularly, when the virus used is of human or swine influenza origin.

No description of the technic involved in the use of the intradermal, subcutaneous, intramuscular, and intraperitoneal routes of inoculation is necessary. To our knowledge, the intrathecal route of administration, and inoculation into special organs and with infected insects have not been practised on the ferret.

In preparation for an intracerebral inoculation, the hair over the cranial site is clipped close to the skin, which is then cleansed with alcohol and painted with iodine. The skin covering the top of the skull is then stretched to one side and held in this position. A short incision is made through the skin with the point of a scalpel. Through this incision, the skull cap is punctured with a small awl-like instrument, which can be made by driving a small brad into a piece of dowling. The head of the brad is filed down to a sharp point. During the operation, the point should not be permitted to pierce the brain substance. This can be controlled by regulating its length. After the inoculation is made by inserting the needle of a syringe holding the inoculum through the hole in the skull cap, the skin over the skull is permitted to assume its natural position, covering the puncture in the skull.

Intravenous inoculation into the ferret, is best performed by cutting down through the skin over the jugular vein before attempting to strike it with a hypodermic needle. The wound may be closed with one suture after the injection and protected with a collodion and shredded-cotton dressing.

These two latter methods of inoculation are greatly facilitated when the animal is placed under light ether anesthesia.

Trillat and Beauvillain [26] have transmitted influenza virus to the ferret, with resulting typical symptoms, by exposing the animal in an enclosed box to air charged with a fine suspension of the infectious material. They also were successful in reproducing the disease in ferrets by instilling the virus into the conjunctival sac.

COLLECTION OF SPECIMENS

Blood can be obtained in quantity with comparative ease from the ferret by cardiac puncture. The animal is held flat on its back and the needle inserted between the ribs, straight downward, just left of the xiphoid cartilage. Small quantities of blood can also be obtained by pricking rather deeply the skin of the tip of the ear. Burnet [17] mentions obtaining blood from the ferret by cutting off the extreme tip of the tail under light anesthesia.

The collection of urine and feces offers a somewhat difficult problem. However, the mere handling of the ferret quite regularly is followed by urination. Small amounts can be caught in a small container at such times. Insertion of a well lubricated, clinical thermometer into the rectum will quite often induce defecation, at which time a small specimen can be gathered.

When the ferret is used in influenza studies, the turbinate tissue is often harvested as a source of virus. The animal is destroyed by intramuscular or intracardial injection of approximately ½ grain of strychnine sulfate, then fastened to a length of board slightly longer and wider than the animal itself with the abdomen down and the legs stretched outward. A piece of cord is passed around the neck at the base of the skull, through holes bored in the board and tied underneath. The lower jaw is anchored to the board in the same manner. In this position, the head of the animal is held firmly during the succeeding operations.

The skin over the skull and down over the nose is removed completely. A small hack-saw blade is then used to cut through the bone transversely across the head from ear to ear. Another incision through the bone is made at right angles extending from the transverse cut down over and bisecting the nose. With a small, but heavy-bladed knife, the two lateral flaps of bone can be pried off the underlying sinuses. The turbinates are then removed with a sterile, small scalpel and forceps.

SUMMARY

1. *Anatomy*—The ferret presents no marked differential features, although the liver and spleen are heavier in proportion to the body weight than is the case in other small animals. The weights of males and females and blood counts are recorded.

2. *Physiology*—Data are presented on the rectal temperature, rate of respiration, a limited amount of blood chemistry and the period of gestation. More detailed descriptions are confined to oestrum in the ferret, mating, size of litters, and the development of the young at birth.

3. *Care of Young—Feeding*—The young should not be disturbed during the first few days of life. Further care and the feeding of the litter are discussed, as well as various diets used for grown animals.

4. *Handling*—Common types of cages and pens used in quartering normal and experimental ferrets and the restraint of the animal are described at length.

5. *Common Natural Diseases*—The ferret is heir to infection caused by the virus of canine distemper and a variant of this agent. Footrot is a common condition appearing in this animal. Hemolytic streptococci, a purulent rhinitis, "boils," scabies, pneumonia, "ear canker," and internal parasites cause less concern.

6. *Artificial Infections*—The ferret has been used principally as an experimental animal in the studies of such virus infections as canine distemper and human and swine influenza. Other viruses producing a syndrome in the animal are those of Rift Valley fever, an acute meningo-pneumonitis, fowl pest, and one found in Swiss mice.

7. *Methods of Inoculation*—The ferret is amenable to all of the more common routes of inoculation. The technic of administering an inoculum intranasally and intracerebrally under light anesthesia is described.

8. *Collection of Specimens*—Blood may be obtained with ease by means of cardiac puncture. Ear and tail bleedings are also used. The collection of urine and feces presents a somewhat more difficult problem. A method of harvesting turbinate tissues is described.

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Appraising a School Health Education Program*

RUTH E. GROUT, C.P.H., PH.D., F.A.P.H.A.

Senior Supervisor of Health Education, Tennessee Valley Authority, Chattanooga, Tenn.

THERE is little question that programs of school health education need to be and can be improved. One finds a growing appreciation among health educators that improvements can best be realized through an evaluation of existing programs in terms of the objectives on which the programs are based.

School health education today is directed toward bringing about desirable changes in the health behavior of children, as well as better attitudes and more thorough understandings in regard to health. Therefore, evaluations of school health education programs ideally should be centered around a study of changes in child health behavior, in attitudes, or in understandings which occur as a result of the program.

Such studies are difficult to make in view of the fact that child changes are often slow and complex and cannot serve as wholly adequate measurements of a program which is being appraised over a short period of time. In addition to the study of the pupils themselves, it may therefore be necessary to consider, in an evaluation of school health education, factors of the school program which are assumed to help produce desirable child adjustments. These factors may include such aspects as teachers' work; the physical environment of the school; the provision of opportunities for experience and practice in terms of whatever changes are being sought and the content of courses.

Evaluation of school health education programs may range from the informal and continuous checking by individual students and teachers of program outcomes to the more formalized and less frequent studies of outcomes made on a broad scale. In a functioning program, both types of evaluation have their place. This discussion, however, will focus on the more comprehensive type of procedure, which, if participated in fully by teachers as well as by supervisory and administrative staff, may have values in the classroom equal to less formal methods.

EVALUATION METHODS

Evaluation studies in experimental school health education programs have been commonly approached in one or

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more of several different ways. Three are mentioned here.

1. *Studies of the effects of the program at a particular stage of development as judged against predetermined standards.*

Morgan [1] in 1936 evaluated health education in the secondary schools of Tennessee in terms of a state-wide study of dietary hygiene as it existed among secondary students in that year. The New York State Regents' Inquiry [2] into the school health programs of that state in 1936 and 1937 consisted of studies of health conditions which were found in selected schools during the short period of the Inquiry. In both instances, standards were set up against which to check the findings.

2. *Contrasts between two periods in the development of the program*

Three typical negro rural schools in Tennessee were studied by the Julius Rosenwald Fund [3] at the beginning of a special health education project in 1932 and again in 1936 after a period of intensive program development. These studies were made in terms of program objectives.

3. *Contrasts between experimental and control groups*

a. *Cross-sectional*—Shuttleworth,[4] in a series of early studies in Cattaraugus County, N. Y., contrasted health conditions in selected schools in Cattaraugus County which had been exposed to a generalized county health program, with conditions in a control group of schools in Steuben County. In Turner's Malden studies,[5] experimental groups exposed to a health education program and a control group were compared as to growth progress and health habits after several years of conscious program building in the experimental groups.

b. *Longitudinal*—The Elizabeth McCormick Memorial Fund Studies, reported by Hardy and Hoefer,[6] consisted of an appraisal of an experimental classroom health instruction program, which was begun in Grade 3, in 1923. Periodic records of physical growth, health behavior, and the like were kept for individual pupils over a 4 year period in both an experimental and a control group. Progress in the two groups was contrasted.

A variety of instruments may be employed in evaluation studies, the selection of which should be determined by their effectiveness in measuring the program objectives under consideration. Often more than one evaluation procedure may be necessary in order to give an adequate appraisal of a particular outcome.

In school health education, surveys, questionnaires, and written tests have been widely used for the measurement of results. Growth records, physical examination findings, records of defects corrected, and pupils immunized have served as indices. A critical discussion of each of these methods or approaches is beyond the possibilities of this paper, since each must be judged in relation to its specific use. It is clear, however, that in the evaluations of the future, greater consideration must be given to the development of more varied and effective instruments. Old procedures must be refined through further experimentation, and new technics, such as direct observations, anecdotal records, and interviews must be explored.

Tyler [7] has stated, "Evaluations are not likely to represent indubitable proof of the success or failure of current educational endeavors. They should present evidence, reasonably objective and accurate, which throws additional light upon the value of these experimental programs."

The soundest evaluations are those which are set up concurrently with the undertakings that are to be measured. They are planned coöperatively by all who are to have a part in the function-

ing of the program, including teachers, administrators, and specialists in school health problems. Only thus may they be relevant to the problems under study and provide adequate data which are free from unnecessary distortion.

Methods used in a special evaluation study will be discussed in some detail in the following paragraphs.

A SPECIAL EXPERIMENT WITH EVALUATION METHODS

As a part of an experimental school health education project which extended over a 6 year period (1932–1938) in Cattaraugus County, N. Y., a series of evaluation studies was attempted in an effort to determine the effectiveness of the program in terms of two objectives, namely, the improvement of pupil health behavior and of pupil understanding in relation to health. Evidences of progress, at both the elementary and secondary levels, were sought through studies of pupil health practices, pupil health information, and phases of the program which were believed to have potential influence in bringing about the desired changes in the children.

At the elementary level, to which this discussion will be limited, comparisons were made between conditions as they existed in the one- and two-teacher schools in 1932, near the beginning of the experimental project, and again in 1936 or later. Comparisons also were made between conditions in Cattaraugus County and a control group of schools in Steuben and Allegany Counties in 1936 near the end of the experimental work. The control group of schools was comparable in all respects except that it lacked organized school and community health programs such as existed in Cattaraugus County. Groups in the studies varied from all of the schools to but a few. Evaluation methods included pupil questionnaires on daily health practices; health information tests; classroom observations on pupil health practices; teachers' work and environmental conditions; teacher questionnaires on work in health education; school environmental surveys; and parent interviews.

The methods employed in the study of pupil health practices and teachers' work will be analyzed here at some length in order to illustrate the variety of methods which may be used and to present certain difficulties that exist in common evaluation procedures. It is only by such critical approaches to existing or projected methods that future progress in this difficult field can be anticipated.

1. *A Study of Pupil Health Practices*

One objective of the school health education program in Cattaraugus County is stated thus: "To help each child to develop and practice health behavior which will contribute to his own well-being and that of others, and progressively to assume greater responsibility and self-direction in this."

Evidences for improvements in behavior were sought through studies of both home and school health practices.

A questionnaire on daily health practices formed the basis for the home studies. Previous experience with this questionnaire, developed by the American Child Health Association for a part of its "Health Survey of 86 Cities," had shown the trustworthiness of the pupils' answers. The questionnaire dealt with sleeping, eating, play, and cleanliness habits largely associated with home living, food in the day's diet, and dental care. The questions follow:

"WHAT YOU USUALLY DO"

Directions:

1. Pass out sheets of paper on which pupils will write answers as questions are given. Have each pupil write date, grade group, and school at top of paper.
2. Let older brothers or sisters help younger ones answer their questions.
3. Answers should be obtained from all

children in Groups C, B, A (Grades 4–8). If possible, obtain complete answers from those in lower grades.

Questions:

1. What time did you go to bed last night?
2. What time did you get up this morning?
3. Name each thing you ate for breakfast this morning.
4. What did you eat for lunch this noon? (not given in 1932)
5. What did you eat for supper or dinner last night?
6. How many cups of coffee did you drink yesterday?
7. How many glasses of milk did you drink yesterday?
8. Did you have an all-over bath last week?
9. Did you brush your teeth yesterday?
10. Have you been to a dentist in the last year (since January last—1932)?
11. How many days were you out of school last week because you were sick?
12. Do you sleep in a room all by yourself?
13. Do you usually eat what is put before you at the table?
14. What does your mother usually give you to eat when you come home in the afternoon after school?
15. What do you usually do after school in the afternoon until your evening meal? Write down one or more of the following: play outdoors, do outdoor chores, help mother in house, play indoors.
16. Do you sleep with a window open?

During the fall of 1932, the set of questions was given by the teachers in the rural schools of Cattaraugus County, N. Y., to all pupils grades 1–8. The same questions were given again in the same schools in the fall of 1936. This time they also were given to the pupils in the control group of schools previously mentioned. Written instructions were prepared for the teachers in order that the tests might be administered as uniformly as possible. The answers were tabulated by one person.

The extent to which these questions were suitable instruments for measuring program objectives needed consideration. Since the program sought to help children to improve their daily health practices, a study of such practices as were included in these questions seemed appropriate. The practices, however, were largely associated with home living, and home influence is known to be great in respect to home habits. Therefore, any changes, or lack of changes, which were found could not be associated entirely with the school program. Moreover, in Cattaraugus County, home influence might also be colored somewhat by the amount and quality of the general community health program, which had developed to a high level in the county. It, therefore, had to be assumed that any superiority which might be shown in Cattaraugus County over the control group should not be attributed to the school health program without taking into account the influence of the home itself, the county health program, or other factors.

A thorough analysis of the data showed findings that had a direct bearing on the program objective involved. It was discovered that health practices in 1936 were significantly better than in 1932, and also than in the control group in 1936. The evidences of improvement, which by and large were most striking at the upper grade levels in 1936, seemed to indicate that the Cattaraugus County school program was slowly producing beneficial effects in aiding pupils to assume greater responsibility for the practice of health habits. If the home had been the principal educative force, one might expect to see more nearly the same differences at all grade levels, and in all three groups studied. Since the principal variable apparently was the school health education program, it seemed fair to assume that it played a vital rôle in bringing about the better practices of Cattaraugus County children in 1936.

Pupil health behavior at school was studied by means of classroom observations. An observation schedule was prepared for the purpose of revealing health practices of children in rural school situations. The situations for study were determined through: (1)

careful consideration of specific objectives of the local program, especially as stated in the handbook which was being used by the local teachers, (2) a study of a teaching guide recently issued by the New York State Education Department, (3) a review of numerous outlines suggesting methods of studying children, (4) expert advice from a specialist in child guidance, (5) deliberation by the director of the experimental project, and others, on problems observed during many previous visits to classrooms. The original observation form, prepared by the observer, the director of the county project, and the specialist in child guidance was revised after preliminary experimentation with it in a group of schools. Some items were omitted entirely, while others were changed for more accurate observation and recording.

The schools for study were selected at random from lists of teachers who were in their schools for the second year or longer. The teachers had been rated by their district superintendents for their general teaching ability, and a proportionate number were selected from each of the three classifications used. The observations in all schools were made by one person and at the same time of day. Each group was observed once. The hours from 9 to 1 were chosen because they gave a good sampling of the school day and also gave opportunity to study noon hour habits of the children. The observer alternated her weeks of observation between the experimental group and the control group of schools in order that the possible influence of seasonal changes might be the same for each group. Observations were directed toward the teacher and her program, the mental attitudes of the children and the school environment, as well as toward the children and their health practices. This discussion is limited to the observations on pupil health practices.

The schedule contained very specific situations for observation which would be indicative of spontaneous everyday behavior within the classroom. A few typical indices are listed below:

Outside clothing is worn in school.
Hands are washed before eating.
Mid-morning lunch consists of milk or fruit.
Fingers, pencils, crayons, etc., kept out of mouths.

The schedule was set up so that records were made of only those acts of individual children who were in situations which gave opportunity for the kind of behavior being studied. Some observations were made on the basis of time sampling. For example, all pupils were observed over a period of 3 minutes for evidences of keeping fingers, pencils, crayons, etc., out of the mouth.

Despite the care which was given to the preparation of the schedule, a number of items were found to be stated in such a way as to make objective observation difficult. In the summary of findings, it was, therefore, necessary to eliminate all items which gave opportunity for error in interpretation. The next step in the further refinement of this schedule will be experimenting with its use by several observers until the findings are comparable. If the schedule should be tried in a new situation, it also will need to be checked for its validity in that situation.

Further experimentation is needed to develop more adequate methods for the study of the effects of a health education program in terms of pupil health behavior. To date little has been done with teacher observations regarding improvements in daily living practices of individual children. Studies of changes in more subtle forms of behavior, such as those which occur in situations that require selection of several alternative behaviors, are lacking. Few comparative studies of the effects of different methods, contents, and materials have

been made. Simple record forms, adapted to classroom use, are essential before real progress in these directions can be expected.

2. A Study of Teachers' Work in Health Education

The whole structure of education is built on the assumption that teachers have an influence in forming habits, in changing attitudes, and in adding to the knowledge and understanding of children. In view of this fact, it was decided, as a part of the evaluation studies in Cattaraugus County, to attempt to appraise the program in terms of its effect on teachers' work in health education. Methods used were: (1) classroom observations; (2) teacher questionnaires on health teaching activities and results during the current school year; and (3) interviews with parents. The first and second methods were applied in both Cattaraugus County and the control group, while the third was applied in Cattaraugus County only. The procedures followed in classroom observations were similar to those just described in relation to pupil health practices. The teacher questionnaires and parent interviews were experiments with new methods.

Near the end of the school year in 1936, 6 questions on health teaching activities were mailed by the district superintendents to all teachers in Cattaraugus County and to about 100 teachers in the control group. Those questions were as follows:

What health teaching activities have you carried out successfully this year?

Please describe in this space at least one in some detail.

What changes have taken place in the health behavior of your pupils as a result of your health program?

What changes have taken place in the school environment as a result of your health program?

In what ways have you tried to reach the parents in health matters? A brief description and a critical statement of your success in this would be helpful.

What improvements do you plan for next year as a result of your experiences this year?

In general, the questions seem to have been understood by the teachers. There were no irrelevant answers on the questionnaire returns, but many were incomplete.

The returns were rated independently by three individuals who were professionally engaged in some form of health education work outside the counties under study. The ratings were made in terms of 7 items of importance in evaluating health instruction. These were the inclusion of important areas of health knowledge, habits, and attitudes; use of real situations and health problems as content of instruction; attention to individual health needs and abilities, child initiative, and originality; types of motivation; results in terms of health habits, attitudes, and knowledge; home coöperation; and plans for the next year. Ratings also were made in terms of total impression. The rating scales were prepared for the purpose by Dr. Ruth Strang. Consideration was given in their preparation not only to local program objectives, but also to the best opinion of experts on what constitutes an adequate program of health education from the standpoint of the teachers' contribution.

The raters showed individual differences in the leniency of their judgments, but in general each seemed to apply a consistent standard. After careful statistical analysis, it was felt that the average rating of the three raters gave a fair interpretation of the practices recorded. Further experimentation with this method of evaluation is needed before its worth as an objective measuring rod can be determined. The rating scales used in this study, however, are believed to have considerable value for informal self-evaluation by teachers of

their health teaching activities. They should also provide helpful material for teachers' meetings where interest is being aroused in the improvement of health teaching. The findings, although incidental to this discussion, showed differences between Cattaraugus County and the control group which were statistically significant and in favor of Cattaraugus County. The points at which greatest differences occurred were types of motivation used, emphasis on important areas of knowledge, habits and attitudes, and use of real situations and problems, all of which were points that had received special attention in the Cattaraugus County program.

As a third approach to evaluating the health education program from the standpoint of the teachers' work in health education, it was decided to turn to the parents of the children in the rural schools which had been reached by the county-wide school health education program. The assistance of the public health nurses was solicited. A parent interview form was prepared, with the help of the nurses, to use in connection with their regular visits to homes of rural school children. Each nurse selected 10 children from representative homes of the community she served. Part I of the form contained questions on specific health practices, immunizations, and defect corrections. These were included in order to direct the parents' thinking toward specific health practices. Part II listed 6 habits, namely, hours of sleep, milk drinking, vegetable eating, cleaning teeth, handwashing before meals and after toilet. Beside each was a space to record the parents' statements regarding it, that is, whether or not a parent felt improvement was needed at the beginning of the school year, whether or not it was shown during the school year, whether or not the school had helped to bring the improvement, and other possible causes for improvement. There also was space to record the parents' answers to the question "In what ways do you believe the health work at school has helped your child in his home health habits? 'Please explain.'" Additional space was allowed for the nurse's own comments on the situation as she reviewed it.

The interview method was used for collecting the information. Written instructions were given each nurse at a meeting preceding the visits. The nurse's word only was relied upon for checking the reliability of the parents' responses. It was the nurses' belief that the mothers were truthful in their statements. When the results were summarized, it was found, that, according to the parents, improvement was shown in 76.9 per cent of the cases where it was felt improvement was needed. In 90.5 per cent of these, the schools were credited for having a part. An encouragingly large number of comments indicated that as a result of the school program the children had gained a better appreciation of the importance of good health habits and a better knowledge of why certain habits should be practised. This comment is characteristic of many: "Mary knows reasons for health practices now. Health practices have improved a great deal. Helps younger children with health habits." In some instances the mothers had a very definite conception of the ways in which the school had helped. In others there was just a general feeling that some good had been done. In a few instances the mothers felt that the school had done little or nothing and in one case the mother stated that personal hygiene had been overemphasized in the school, almost to the point of "nagging," and that the net result had been the arousing of the children's antagonisms.

In addition to the values that were gained from using these interviews as a method of appraisal, they proved to be

helpful to the nurses in their home guidance activities. Numerous problems arose for which the nurses were able to give some tangible assistance.

The evaluation studies, added to other information on the status of the schools and the socio-economic conditions of the community, helped to determine the future growth of the program as regards method, content, and materials. To illustrate, it was found through these studies that nutritional habits were poor. Milk drinking was prevalent, as might be expected in a dairying region, but diets on the whole were poor in vegetables and fruits. The economic level of farm families was known to be low and soil surveys had shown that nearly half the land is unsuited to agriculture. The multiplicity of this nutritional problem pointed to the need for extended coöperation on the part of health and school workers, agricultural extension agents, and community groups to attack the problem from every angle. Slight improvements had already occurred in the 4 years' period, which may have been associated with a county-wide emphasis on home vegetable gardens, better dietary standards for children, and school lunches. Further development of such projects was indicated.

FUNDAMENTAL PRINCIPLES OF EVALUATION

As a result of the experience in evaluation in Cattaraugus County and an analysis of literature on experiments elsewhere, several fundamental principles have been capitulated. These are listed here with the anticipation that they may be enlarged and changed as new experiments in measurement are attempted. They are as follows:

1. The objectives of a health education program should be stated in dynamic terms before evaluations are attempted.
2. Evaluations of a health education program should be made in the light of program objectives.
3. In an experimental program, plans for evaluation studies should be set up concurrently with the undertakings that are to be measured.
4. Evaluation instruments should be so constructed that they will give as objective evidence as possible of the changes which the program seeks to produce. More than one evaluation procedure may be necessary to give an adequate appraisal of a particular outcome.
5. The determination of evaluation procedures should be a coöperative enterprise.
6. In making evaluations, as many factors as possible should be controlled.
7. Summarization of findings in evaluations should be sound and based on as objective evidence as can be obtained.
8. Findings should be interpreted against broad backgrounds, including socio-economic conditions within the groups being studied.
9. Practical use should be made of the findings in order that there may be genuine program growth resulting from the studies. The evaluations themselves may be expected to have educational value for those participating in them.

Evaluation of school health education will progress as more scientific indices and methods are developed. We must turn to the medical profession and nutritionists for further knowledge on what constitutes optimal physical growth and development. We must look to the physiologist, the sanitarian, and the epidemiologist, for more tangible standards against which to check existing health practices. From our psychologists and educators must come greater assistance in the development of methods for the measurement of behavior and attitudes. On each of us, however, will rest the task of unifying these contributions into a constructive plan which is workable in the situation under study.

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Wars, Plagues, and Famine

SINCE the beginning of history, wars have produced plagues and famine. It is urgent that we in the American republics put our scientific knowledge fully to work to prevent the spreading to our own countries of the major plagues which seem inevitable in the war-torn lands. Yet we cannot avoid direct effects upon the health of our people resulting from the current conflict. Even though some impossible destiny were to stop the war tomorrow, the effects of it would be felt throughout our generation in a lowered standard of living among all peoples. With so much of the productive human energy and the natural resources of so many nations given to death and destruction, world wide economic repercussions are inevitable. Whatever consumes the wealth of the world reduces the ability of the masses of the people to provide decent standards for healthful living.—Dr. Thomas Parran, in an address at the Opening Session of the Fourth Pan-American Conference of National Directors of Health, May 1, 1940.

An Administrative Approach to Industrial Hygiene*

W. SCOTT JOHNSON, M.S., F.A.P.H.A.
Chief Public Health Engineer, State Board of Health, Jefferson City, Mo.

ADMINISTRATIVE plans for the development of industrial hygiene at this time appear particularly important. Only within the last few years have state health departments, with one or two exceptions, given serious consideration to the organization of effective control programs in this field. It was essential to decide two points before the administrator could intelligently propose a program: (1) what industrial hygiene includes, (2) the nature and extent of the industrial hygiene problems.

Largely as a result of the recent emphasis placed on the public health approach to industrial hygiene, as contrasted with a previous approach essentially from the standpoint of the industrial employer, the definition and field of industrial hygiene have been materially expanded. The preservation of the health and welfare of the worker in its broadest sense is rapidly being accepted as the scope of industrial hygiene.

Lacking definite information concerning the number employed, exposure to various hazards, sickness or mortality records, and other essential data necessary to a conception of the industrial hygiene problem, a number of states and a few cities within the last four or five years have made comprehensive surveys. As a result of these accumulated data we are able in general to outline the problem for any state or locality. Incidentally, valuable training has been acquired by a small but strategically located group of doctors, engineers, and chemists. In other words, information essential to developing a plan of procedure is complete. The public health administrator is not faced with the problem of preparing that plan by means of which the health protection to the 50 million employees in this country will be developed during the next quarter of a century. The approach to industrial hygiene has been centered largely on a few specific diseases of a dramatic nature with no definite long-range program to include the health protection of all the workers. In view of the marked recent incentive to extend the public health aspects of industrial hygiene it is unnecessary to emphasize its importance, from every standpoint, and the responsibility which faces the public health administrator at this stage in the development of industrial hygiene. Not only the ultimate success but also the speed with which an adequate service is made available largely depends upon the plan of administrative procedure selected.

I am concerned with how we can bring to all the employed the benefits of proven means of prevention and con-

* Read at a Joint Session of the Engineering and Industrial Hygiene Sections of the American Public Health Association at the Sixty-eighth Annual Meeting in Pittsburgh, Pa., October 18, 1939.

trol of disease and sickness by state health department administration of industrial hygiene on a state-wide basis. We believe the essentials of a sound approach to the administration of industrial hygiene by a state health department can be briefly stated. The administration of industrial hygiene should follow those lines of procedure found fundamentally sound for the administration of other public health activities involving large populations. After many years of experience with various programs for public health administration within states, it would seem that a pattern has finally been evolved which is essentially sound and sufficiently flexible to fit the varying needs. The important program of industrial hygiene can be best administered in conformity with this pattern.

At present in Missouri there are local health services in the form of city, county, or district units that cover the entire state. This service is by no means adequate in many localities due to insufficient personnel and the necessity of including too great an area in most of the districts. Each unit provides medical, public health engineering, and nursing services.

It is the established policy that all health programs shall be integrated into the local health services, and the State Board of Health shall function in an advisory and supervising capacity. We believe administratively an industrial hygiene program for this state can be effected in this manner and that to weave industrial hygiene closely into the local health activities offers many desirable features from the standpoint of that service as well as the general public health program.

There are 1½ million wage earners in Missouri, 40 per cent of whom are engaged in industrial work which is potentially hazardous. On the basis of numbers this represents a major health problem demanding the services of all types of technically trained health personnel functioning on a well organized basis. It is inconceivable that satisfactory industrial hygiene health service, for 1½ million persons located in various parts of a state 69,420 square miles in area, could function out of the central state department of health. In order to include approximately 80 per cent of those wage earners in the more potentially hazardous industries only, it is necessary to consider 21 widely scattered counties, 5 with full-time health units, and 5 of the larger cities all of which have organized health departments.

The nature of industrial hygiene activities demands readily accessible service and a confidential relationship between the health administrator and the industrialist. On many occasions the contacts and acquaintanceships of the local health officer have simplified and been largely responsible for the satisfactory relationship with industry. Further, as the program progresses, the frequency of requests and routine nature of the control work demands the presence of local personnel, medical and engineering, to attain effective results.

Again, in placing the responsibility for industrial hygiene upon existing health officials the advantage of their general knowledge of public health and the increase in numbers of those concerned and interested in this problem will automatically occur. This integration into the local health program permits the influence of well rounded health programs to become available to the wage earning population. Thus communicable diseases, venereal disease, pneumonia, sanitation, etc., all become included with the strictly industrial diseases in the program. In fact, if a broad concept of industrial hygiene is accepted, it is difficult to conceive its successful administration except as closely integrated with the general local health program.

Another important factor in the success of an industrial hygiene program involves the assistance and coöperation of professions in the community directly or indirectly concerned with industry. The industrial engineer, nurse, and particularly the plant physician, as well as the general practitioner, constitute a potential and actual source of assistance that must be effectively brought into the picture. Their interest and coöperation can be enlisted and retained by the local health personnel far more easily than through infrequent contacts with state personnel.

From the standpoint of the local health unit there are also advantages in including industrial hygiene as a component part of the program. Industrial hygiene presents an opportunity for the local health officials to include in their activities the health of adult workers, a large important group that has received little health protection beyond sanitation in the past. The greatest opportunity for life saving and disease prevention lies at this time in the class largely represented by the wage earners. Further reduction in sickness and absenteeism among those employed represents greater efficiency and economic advantage to the employer. Consequently, through a program of industrial hygiene the local health officer probably for the first time is in a position to meet and favorably impress the industrialists and business men of his community with the importance of public health. Such an excellent, as well as unusual, opportunity to gain public support from the most influential sources is seldom otherwise available to the health official.

The approach through industry to the health of the wage earner offers the same advantages inherent in school health programs, namely, large numbers readily accessible and, from the community standpoint, a group whose health is vitally important. The opportunities for case finding among the adult population seem excellent as the industrial hygiene program progresses to the stage of physical examination. In addition, better morbidity reporting in cooperation with industry has been developed in one or two instances which is of considerable general health importance and particularly essential to more effective industrial hygiene control.

In view of these advantages, many of which have been actually experienced in our early work, the following administrative procedure was developed for the promotion of an industrial hygiene program in Missouri:

There has been organized in the central office of the State Board of Health a small specialized but complete industrial hygiene service consisting of a doctor, an engineer, and a chemist, with field and central laboratory equipment. Since the industrial hygiene activities are decentralized and integrated into local health units and involve medical as well as engineering problems, the administration of industrial hygiene work on the part of the State Board of Health is placed under the Division of Local Health Administration and Division of Public Health Engineering.

This plan is unique, but under our circumstances appears entirely logical. It is succeeding in Missouri possibly because we have already recognized the need and importance of close administrative coördination between these two divisions in practically all our programs dealing with field activities of a public health engineering significance. For the sake of effective central organization necessary to promote accomplishments in the field, where the actual work must be done, we are convinced that fewer state department divisions, and better coördination of existing divisions, are absolutely essential.

As rapidly as possible, and in accordance with the importance of the problem, services are being established

in the district, county, and city health units. The local service established naturally depends upon the seriousness of the problems as well as the per cent of population industrially employed. In a number of instances one or more of the personnel in the local health unit are required to spend full time in this service. In other cases the existing full-time county or city medical officer and public health engineer are able to control industrial hygiene effectively on a part-time basis. Lastly, in certain areas industries are so few that the district personnel with some aid from the central office is able to cope with the problem.

The function of the State Board of Health in this program is largely educational, promotional, and supervisory. Its part of the program is to promote among the existing health units an interest in industrial hygiene, and train the personnel of such units in methods for developing a definite program, procedure for the control of the health and welfare of the wage earner, and supervise the work of local health units after the service has once been established. A further important function of the State Board of Health involves maintaining close coöperative relationship with the other official and nonofficial agencies that are concerned with the wage earner's welfare.

The results in Missouri in developing this plan of administrative approach to industrial hygiene reinforce our belief in its fundamental soundness. In the largest industrial center the City of St. Louis, we have subsidized two full-time engineers who are working in conjunction with the existing medical and laboratory facilities on a definite industrial hygiene program for that area. In brief, during the past three years the St. Louis program has covered such phases of industrial hygiene as silicosis in the foundry industry, health hazards in electroplating, a study of lead exposure in a large plant, and many miscellaneous surveys and control activities.

In St. Louis County, having a large industrial population, one full-time public health engineer has been assigned to industrial hygiene work in coöperation with the existing medical, engineering, and nursing personnel. In the last year the St. Louis County program has included: training local personnel including one full-time industrial engineer; surveys, including quantitative studies in 37 plants, employing approximately 4,000 persons, and follow-up reports with recommendations; improvements involve about 10 per cent of employed persons; and a detailed study of limestone quarries.

In another county having relatively minor industrial hygiene problems the existing public health engineer has been given training, and with the county medical health officer is undertaking a definite industrial hygiene program which requires only a part of his time. In a number of instances studies and reports on individual industries were made upon request in various localities in the state. The work was undertaken in every case in company with the district engineer in order to train local health personnel and establish a background for future check-up.

As rapidly as finances and personnel are available, and guided by our past experiences, it is intended to develop industrial hygiene services of a type justified by the extent of the problem in those areas where such a program is needed and will become a valuable intricate part of existing public health activities. We appreciate that this plan of administration will develop the service slowly, which is probably in the long run desirable and certainly no departure from the usual experience in public health activities. We believe that as eventually developed it will afford an adequate health service to the wage earner, further will have the ad-

vantage of being thoroughly integrated into the general pattern of our public health program for any particular area, and will be sufficiently flexible to serve the particular needs of the locality concerned. Probably most important of all, this plan of administration is so designed that it can be expanded, without the necessity of any radical change, to provide ultimately to all wage earners of the state effective health protection.

A Question of Space

"OUR readers may notice that the whole of this issue of *Public Health* is printed in the smaller of the two sizes of type which have been used hitherto. . . . The use of the present size of type goes some way towards solving for us the accentuated problem of getting the quart into the pint pot, and we hope to find adequate 'living room' for important contributions in the future as in the past. We do, however, take this opportunity of reiterating our appeal to contributors to cut out all redundant verbiage before they submit their papers. Such coöperation on their part will save much 'blue-pencilling'—both verbal and physical—on the part of the Editor."—Editorial, *Public Health*, London, May, 1940, p. 165.

To What Degree Are Mortality Statistics Dependable?*

H. O. SWARTOUT, M.D., DR.P.H., AND ROBERT G. WEBSTER

Director, Bureau of Communicable Disease Control; and Chief, Division of Vital Records, Los Angeles County Health Department; Los Angeles, Calif.

TO Cabot [1] should go much of the credit for stirring up general interest among progressive American physicians in checking clinical diagnoses by postmortem findings in fatal cases of disease. It seems strange, in view of this known interest, that so few studies following his pattern have ever reached publication. Analogous studies with a view to judging the possible effect of erroneous clinical diagnoses upon mortality statistics have apparently been even less frequently made, though their value to public health people and others concerned with such data can hardly be questioned.

The first published study of this sort known to us was made in 1934 by the senior author.[2] It was based on 1,805 New Haven Hospital autopsy records and their corresponding case histories. Incomplete information has come to us about a 1937 German study [3] of 8,182 cases, which was apparently somewhat similar, though not enough so to guarantee that a comparison of findings would be fruitful.

We have available in the Los Angeles County General Hospital an unexcelled field for such a study. About 2,000 autopsies a year are performed in that institution, and good records are kept. Dr. Newton Evans, Chief Pathologist, made these records available under proper professional safeguards; and this report is based on the records of 8,080 cases that came to autopsy during the years 1933 to 1937, inclusive. No coroner's cases or stillbirths were included.

Before beginning the report of the study proper, we should explain two peculiar problems facing diagnosticians in the Los Angeles County General Hospital. In the first place, many of the patients are Mexicans, people of some other foreign nationality, or people alone in the world. Because of language difficulties or because nobody but a very ill or almost moribund patient can be found to tell the story, it is frequently impossible to obtain a satisfactory history, which obviously often makes the matter of arriving at an accurate diagnosis extremely difficult.

In the second place, many of the patients enter the hospital only when death is near, and there is limited time for the physical and laboratory examinations necessary for correct diagnosis. Thirty-eight per cent of the cases we studied had been in the hospital 48 hours or less before death, and the

* Read before the Vital Statistics Section of the American Public Health Association at the Sixty-eighth Annual Meeting in Pittsburgh, Pa., October 20, 1939.

TABLE 1

Ante-mortem Diagnoses Checked by Autopsy

Code No.	Disease Classification *	Total Cases	Correct Diagnoses	Per cent Correct
7	Measles	34	34	100
8	Scarlet fever	35	35	100
9	Whooping cough	45	44	98
10	Diphtheria	97	95	98
13b	Bacillary dysentery	28	26	93
16	Acute poliomyelitis	61	56	92
18	Epidemic cerebrospinal meningitis	82	79	96
23	Tuberculosis of the respiratory system	668	604	90
24	Tuberculosis of the meninges	57	51	89
32a	Acute disseminated tuberculosis	51	30	59
34	Syphilis	199	151	76
36	Purulent infection—septicemia	40	25	62
43	Mycoses	27	25	93
45	Cancer of the mouth and pharynx	61	61	100
46	Cancer of the digestive tract and peritoneum	480	426	89
47	Cancer of the respiratory system	99	71	72
48	Cancer of the uterus	114	106	93
49	Cancer of other female genital organs	33	30	91
50	Cancer of the breast	66	64	97
51	Cancer of male genitourinary organs	99	71	72
53	Cancer of other organs, unspecified	119	84	71
54d	Nonmalignant tumors of the brain	28	19	68
55d	Tumors of the brain, unspecified	47	35	74
59	Diabetes mellitus	139	135	97
62	Pellagra	33	31	94
71a	Pernicious anemia	34	24	71
72a	True leukemias	44	35	79
75	Alcoholism	70	61	87
78	Nonepidemic encephalitis	29	14	48
79a	Simple meningitis	75	59	79
82a	Cerebral hemorrhage	251	185	74
82b	Cerebral embolism and thrombosis	171	130	76
82c	Softening of the brain	32	5	16
89a	Diseases of the ear	111	75	68
89b	Diseases of the mastoid process	71	56	79

* Not all cases studied are listed here, only those with more than 25 cases per class.

errors in ante-mortem diagnoses in this group were approximately twice as frequent as among the group that were in the hospital more than 48 hours before death.

Our study was aimed strictly at the mortality statistics target and was not intended as a test of the diagnostic ability of hospital physicians from the point of view of clinical medicine. For that reason our criteria of correctness of or error in the stated cause of death were taken from the last (1929) edition of the *Manual of the International List of Causes of Death;* and, whenever two or more causes were listed as ante-mortem diagnoses or post-mortem findings, or both, precedence was given to one or another in accordance with the rules in the *Manual of Joint Causes of Death.* We had for comparison, therefore, a list of deaths charged to causes as they would have been had no autopsies been performed, and the same list charged to causes as found at autopsy, these causes being those regularly listed in statistics on mortality.

In Table 1 we present the figures as we found them. All the cases represented 176 of the causes listed in the *Manual;* but for the sake of brevity and because the general principle is as well demonstrated by an abridged report, we have included in the table only those classes represented by more than 25 cases, the number of such classes being 69. The totals at the foot of the table, however, represented *all* the cases studied and not simply those listed.

As might be expected, the errors in

TABLE 1—(Cont.)

Ante-mortem Diagnoses Checked by Autopsy

Code No.	Disease Classification *	Total Cases	Correct Diagnoses	Per cent Correct
91a	Acute endocarditis	60	45	75
94b	Diseases of the coronary arteries	219	145	66
95b	Other and unspecified diseases of the heart	631	526	83
97	Arteriosclerosis	85	56	66
106b	Chronic bronchitis	51	15	29
107a	Bronchopneumonia	232	160	69
108	Lobar pneumonia	277	196	64
110	Pleurisy	29	24	83
114b	Other lung diseases, including gangrene	47	31	66
115a	Diseases of the pharynx and tonsils	33	25	76
117a	Ulcer of the stomach	136	105	77
117b	Ulcer of the duodenum	57	31	54
120	Diarrhea and enteritis, over 2 years	28	8	29
121	Appendicitis	177	160	90
122a	Hernia	76	60	79
122b	Intestinal obstruction	109	96	88
123	Other diseases of the intestines	39	19	49
124b	Cirrhosis of the liver	77	51	66
125b	Other diseases of the liver	33	17	51
126	Biliary calculi	30	17	57
127	Other gall-bladder diseases	56	41	73
130	Acute nephritis	29	20	69
131	Chronic nephritis	99	70	71
133	Other diseases of the kidneys	46	20	43
134	Urinary calculi	26	21	81
136a	Stricture of the urethra	27	17	63
137	Diseases of the prostate	159	130	82
139b	Diseases of the ovaries, etc.	47	31	66
140	Septic abortion	27	24	89
152	Acute abscess, phlegmon	36	31	86
157d	Miscellaneous congenital abnormalities	57	49	86
158	Congenital debility	27	25	93
159	Prematurity	349	345	99
200b	Undetermined	27	15	56
	Totals	† 8,080	† 6,365	79

* Not all cases studied are listed here, only those with more than 25 cases per class.
† These totals include *all* cases studied, not simply those listed above.

some classes appear much larger than in others. Taking the 8,080 cases as a whole, however, the 79 per cent of success in ante-mortem diagnoses which they indicate does not seem good enough to warrant the use of ordinary mortality data as the basis for some of the fine-spun calculations and predictions that we have seen based on such data. We make this broad statement because we doubt that the average per cent of success achieved elsewhere throughout our country exceeds, or even equals, that attained in the Los Angeles County General Hospital, though there may be some places that excel it.

We estimate a somewhat greater percentage of success in unautopsied cases than in autopsied cases, but not much greater, because requests for autopsy routinely follow all deaths in this hospital and the frequent tendency for autopsies to be performed only on cases that present great difficulty in diagnosis is thereby minimized.

The whole question, however, has two brighter aspects. First, whenever autopsies are performed nearly all of the previous errors are corrected; and the deaths are in such instances charged to their proper causes. In the above mentioned hospital, about 40 per cent of deaths, some months considerably more than that, are followed by autopsies, so the correction figure from this source alone may reasonably be as-

sumed to raise the total percentage of success well up toward 90. This, of course, cannot be said of all deaths that occur in the United States.

Second, in health publications and in various other phases of health education, we rarely use the classes of causes of death as given in the *Manual*. Broad as these classes seem to the clinician, they are much too narrow for effective publicity. The Los Angeles County Health Department follows a practice that is quite common, and in its *Annual Report* gives a list of what people often call the "Ten Leading Causes of Death." In last year's report the list was as follows:

1. Diseases of the heart
2. Cancer and other malignant tumors
3. Nephritis
4. Cerebral hemorrhage, embolism and thrombosis
5. Tuberculosis
6. Violent and accidental deaths
7. Pneumonia
8. Other diseases of the circulatory system
9. Congenital debility and malformations
10. Suicide

When grouped into these larger classes, and when the ante-mortem diagnosis which fell anywhere within the class to which the actual cause of death belonged was not charged as an error, the percentage of successful clinical determinations of causes of death rose to approximately 90, as indicated partially by the first three columns of figures in Table 2. Assuming, as is reasonable, that about 40 per cent of all diagnostic errors were corrected by autopsy, the causes of death as stated on death certificates issued from the hospital were about 93 or 94 per cent correct from this broad point of view.

In Table 2 we list the 5 large groups most commonly discussed among the 10 leading causes of death. To get an idea of how far the true picture in any group varies from that which would be given if no autopsies were performed, we must obviously compare the total number of clinical diagnoses rightly or wrongly assigned to that group with the total number of autopsy-proved cases properly belonging to that group. For example, if no autopsies were performed, 808 of the 8,080 cases would have been charged to tuberculosis, while autopsies showed that 834 cases should have been so charged, and so on.

A careful study of the records shows that mistakes in clinical diagnoses, which of course may be in either direction, go a long way toward cancelling each other. We do not say this to excuse mistakes, but after all it does leave us with a situation not nearly as bad as it might seem. The most questionable feature is an apparent tendency to attribute deaths to some of the more frequent causes when certain symptoms point that way, and not to keep on studying until everything possible has been done to check the correctness of the diagnoses. In our study the most outstanding evidence of this tendency was found in the "apoplexy group,"

TABLE 2

Special Study of Five Large Disease Groups

Code Numbers Covered by the Disease Group	*Name of the Disease Group*	*Cases Proved by Autopsy*	*Correct Clinical Diagnoses*	*Per cent of Correct Clinical Diagnoses*	*Total Clinical Diagnoses*	*Net Percentage of Error* *
23 to 32c	Tuberculosis Group	834	749	90	808	3
45 to 53	Cancer Group	1,087	963	89	1,050	4
82a and 82b	Apoplexy Group	422	384	90	501	19
91a to 95b	Heart Disease Group	937	877	94	972	4
107a to 109	Pneumonia Group	521	429	82	518	1
	Total	3,801	3,402	90	3,849	1

* Some of these errors were errors of excess, others of deficit.

where considerable numbers of cases of brain neoplasms, cerebral arteriosclerosis, and several other symptomatically similar conditions had been diagnosed as cerebral hemorrhage, thrombosis, or embolism. This was the only group, however, in which the net error exceeded 5 per cent.

We conclude from our study, therefore, that caution should be exercised in talking about trends and making comparisons based on small differences in reported death rates from specific causes; but we are certainly justified in the main when we list the leading causes of death in the order that we do and talk to the public about their relative importance and what may be done to meet the problems which they present.

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The Function of Government

IT is a function of government to preserve the person as well as the property of man . . . and there can be no national progress except through promoting the health and welfare of the citizens of the Nation—Senator James E. Murray, *U. S. Senate Report on the National Hospital Act of 1940.*

Mortality in the Children of Tuberculous Households*

MIRIAM BRAILEY, M.D., DR.P.H.
Associate in Epidemiology, The Johns Hopkins University School of Hygiene and Public Health, Baltimore, Md.

IT is the purpose of this paper to present an analysis of the risk of mortality in the children of families containing an adult with the diagnosis of pulmonary tuberculosis. The analysis is limited to unselected children entering the household under 15 years of age, and their mortality has been studied only to age 20.

The records for analysis are those of an outpatient clinic for childhood tuberculosis conducted since 1928 at the Harriet Lane Home of the Johns Hopkins Hospital. Children are admitted to this clinic during infancy, and for each child a family record is kept. Such records contain a complete roster of each household in question, going back to the date of its establishment, and supplying data for the past and present health of each member of the household with respect to tuberculosis. To obtain a date at which intrafamilial contact might be considered as having begun, careful inquiry was made to find out as accurately as possible in each instance the time, preceding diagnosis, at which symptoms first appeared in the adult. Observations on these families have covered varying periods of time, and for the purpose of this paper ended December 31, 1937.

There are 285 households represented, of which 138 are white and 147 are colored, and the total number of unselected children included is 1,383.

Of the 285 households represented, 248 contained a case of sputum-positive or fatal pulmonary tuberculosis in an adult; while in the remaining 37 the sputum of the diseased adult was either repeatedly negative, or its status unknown. The proportion of families exposed to cases not classed as sputum-positive or fatal was about the same in both races. Since the number of individuals coming from families containing the less infective type of disease was small, 159 out of a total of 1,383, it proved impractical to deal with them separately, and accordingly the entire group of households have been considered together.

For some families the period of intrafamilial contact was long, for others short, and about 15 per cent of the white children and 22 per cent of the colored escaped known contact altogether. Every effort was made to get the tuberculous adult out of the home as soon after diagnosis as possible. No attempt has been made in this study, however, to relate duration of contact and mortality. The purpose was to measure the difference in mortality in these families before and after the establishment of known exposure to tuberculosis.

* Read before the Epidemiology Section of the American Public Health Association at the Sixty-eighth Annual Meeting in Pittsburgh, Pa., October 20, 1939.

TABLE 1

Age-specific Mortality from All Causes and from Tuberculosis in 523 White and 594 Colored Children After the Onset of Known Contact with Adult Pulmonary Tuberculosis

Age	Person-years	Deaths			
		All Causes		Tuberculosis	
		Number	Rate per 1,000	Number	Rate per 1,000
		White			
0– 1	168.63 *	8	47.44	2	11.86
1– 4	929.25	14	15.07	4	4.30
5– 9	1,132.50	6	5.03	1	0.88
10–14	745.00	0		0	
15–19	398.00	4	10.05	3	7.54
		Colored			
0– 1	134.06 *	16	119.35	8	59.68
1– 4	808.75	28	34.62	15	18.55
5– 9	1,051.25	4	3.80	4	3.80
10–14	721.25	2	2.77	2	2.77
15–19	370.00	9	24.32	8	21.62

* In calculating the life-experience of children observed for part of the first year of life, age was recorded as under 3 months, 3–6 months, and 6 months to 1 year. The sum of the average experience in these shorter intervals was added to the experience of infants observed their entire first year, to give the total life-experience under 1 year of age.

Accordingly, mortality from all causes and from tuberculosis, derived by a modified life-table method, was determined for the 1,383 children, the experience of each individual being divided according to whether it fell prior or subsequent to the onset of contact with a tuberculous adult within the household. The application of life-table methods to clinical data was developed largely by Dr. Frost and the technic is already familiar to many epidemiologists. The steps in this procedure as applied to the data of this study cannot be described in this brief note, but will appear in the publication of the full-length paper.

Age-specific mortality rates for the 523 white and 594 colored children after the onset of exposure within the family are shown in summary form in Table 1. Death rates for all causes and for tuberculosis are shown separately. The rates given are annual rates, and where they apply to an age period of more than 1 year, they are the mean death rates experienced in each year throughout that age period.

Table 1 indicates that the colored tend to suffer a considerably higher mortality than the white. It also shows that for both races, the highest mortality is encountered during the first year of life, and this is true for tuberculosis as well as for all causes. There is a sharp decline in mortality in children of both races, aged 1–4 years, and the lowest level of all is maintained fairly uniformly from 5 to 14 years of age. Thereafter, between 15 and 20 years of age, mortality from tuberculosis suddenly increases in both races. In the colored the increased risk at this later age approximates the high rate observed for children aged 1–4 years, but nowhere nearly approaches the tuberculous mortality observed for the first year of life. The white death rate from tuberculosis for the years 15–19 lies numerically between that observed for infants under 1 year and the rate for children of this series aged 1–4 years.

Mortality from tuberculosis in infants under 1 year of age who have had contact with tuberculosis is all the more striking because our records show that infants under 1 year in the tuberculous households of our series showed the lowest prevalence of positive tuberculins. In this series deaths from tuberculosis have not occurred in the tuberculin-negative. Coincident with the sharp rise in prevalence of infection noted in exposed children after 1 year of age, mortality from tuberculosis paradoxically begins to decline. It seems clear that no period in childhood suffers so high a case fatality as the first year of life.

It is of special interest to measure the whole mortality risk experienced in passing from birth to age 20 after tuberculosis has made its appearance in these households. In summary form the probabilities of dying, or the *cumulative* mortality risk from birth up to age 20 are shown in Table 2.

The indicated deaths per 1,000 from all causes up to age 5 are 105 for white children and 235 for colored. To age 20, cumulative mortality is for the white 183 and for the colored 349 per 1,000. The tuberculosis mortality risk, similarly computed, is for the white 83 and for the colored 247 per 1,000 to age 20.

Comparing the rates for the colored and for the white, it is seen that with considerable uniformity between birth and age 20, the colored have a probability of dying from all causes which is twice that for white children. With respect to tuberculosis, the disparity of risk between white and colored is even greater. Before the end of the first year of life, colored children exposed to tuberculosis within the family are 5 times more likely to die than are white children. This difference is more nearly fourfold in mid-childhood, but stands at 4.7 at age 15. That is, exposed colored children are 4.7 times more likely to

TABLE 2

Mortality Risk, Age-specific and Cumulative, from Birth to Age 20, for 523 White and 594 Colored Children Observed from the Onset of Known Household Contact with Adult Pulmonary Tuberculosis

	Mortality Rates per 1,000			
	All Causes		*Tuberculosis*	
Age	*In Current Period* m_x	*In Current and All Previous Periods* q_x*	*In Current Period* m_x	*In Current and All Previous Periods* q_x*
		White		
0– 1	47.44	46.34	11.86	11.81
1– 4	15.07	105.28	4.30	29.76
5– 9	5.30	127.47	0.88	33.70
10–14		127.47		33.70
15–19	10.05	183.18	7.54	83.47
		Colored		
0– 1	119.35	112.63	59.68	57.95
1– 4	34.62	234.82	18.55	129.52
5– 9	3.80	248.46	3.80	145.03
10–14	2.77	260.00	2.77	158.15
15–19	24.32	349.38	21.62	247.27

* The cumulative rate q_x represents the probability of dying some time between birth and the end of the age-period in question, in contrast to the average annual age-specific rate designated here as m_x.

TABLE 3

Distribution in Calendar Years of Life-experience in Each Age Period in Tuberculous Families Before and After Establishment of Known Contact

White Families

Year	Age 0–1	1–4	5–9	10–14	15–19
		Person-years Before Contact			
1901–1905	6.51	11.79			
1906–1910	9.30	29.03	17.45		
1911–1915	22.78	42.64	42.71	17.20	
1916–1920	59.98	145.16	54.20	45.87	14.76
1921–1925	92.07	273.09	159.84	59.73	48.43
1926–1930	102.30	232.73	187.86	100.82	27.67
1931–1935	53.02	146.07	84.74	44.91	14.76
1936–1937	6.04	17.24	14.70	11.47	1.38
Total	352.0	897.75	561.50	280.00	107.00
		Person-years After Contact			
1911–1915	0.50	0.50	2.03	1.02	
1916–1920	0.50	8.46	7.10	9.20	9.24
1921–1925	20.98	58.53	28.82	9.73	10.77
1926–1930	78.33	288.26	271.51	126.57	44.31
1931–1935	59.36	490.92	603.68	443.44	222.65
1936–1937	8.96	82.58	219.36	155.04	111.03
Total	168.63	929.25	1,132.50	745.00	398.00

TABLE 4

Distribution in Calendar Years of Life-experience in Each Age Period in Tuberculous Families Before and After Establishment of Known Contact

Colored Families

Year	Age 0–1	1–4	5–9	10–14	15–19
		Person-years Before Contact			
1901–1905	2.77	9.27	1.90		
1906–1910	12.04	25.04	12.82	2.34	
1911–1915	24.08	55.17	33.72	18.72	3.67
1916–1920	53.71	139.08	80.73	35.57	18.84
1921–1925	101.40	280.93	193.28	88.92	47.78
1926–1930	132.88	362.52	290.39	152.56	70.29
1931–1935	109.73	285.10	163.12	137.35	57.89
1936–1937	20.14	49.14	41.79	14.04	11.03
Total	456.75	1,206.25	817.75	449.50	209.50
		Person-years After Contact			
1911–1915	0.51				
1916–1920	6.14	15.41	1.60		
1921–1925	8.24	28.75	35.29	11.44	
1926–1930	39.58	166.66	166.05	99.67	43.44
1931–1935	63.85	470.56	611.17	416.56	217.98
1936–1937	15.74	127.37	237.14	193.58	108.58
Total	134.06	808.75	1,051.25	721.25	370.00

die of tuberculosis between birth and age 15 than are exposed white children.

One might suppose that a direct comparison could be made in these families between mortality rates computed for individuals after the establishment of contact and rates prevailing before its known establishment. But this would be an unsound procedure in this instance because most of the life-experience prior to contact occurred earlier in time than did the life-experience after known exposure to tuberculosis began; and during the passage of time, death rates have been falling in Baltimore as in most large cities. This decline in death rates in recent years has been especially conspicuous in infant mortality and in mortality from tuberculosis, and is sufficient to mask completely the rôle played by intrafamilial contact in the more recent time-period when exposure took place.

Therefore, the life-experience of each individual, both before and after the onset of intrafamilial exposure to tuberculosis, had to be distributed in calendar time, and was collected into person-years of experience for 5 year periods from 1901 to 1937, the calendar interval for which these households supplied vital data. Tables 3 and 4 show these distributions for the two races.

The prevailing city rates for each of these semi-decades were then applied to the person-years of life-experience falling within the semi-decades, and by this means an expected number of deaths was obtained for comparison with the number of deaths actually observed. In this way observed mortality both before and after the onset of contact could be evaluated correctly, using the risk in the community at large as a basis for comparison.

The expected number of deaths from all causes at prevailing city rates, and the deaths actually observed at each age before and after the establishment of known contact are shown in Table 5. Considering first the experience before contact in the white families: the number of deaths from all causes observed in children under 1 year of age falls considerably below the expected number; and yet beyond 1 year of age, observed deaths for the ages 1–19 significantly outnumber the expected. Under-enumeration of deaths in early infancy probably accounts for this inconsistency. In a study where data are secured in retrospect for an interval of time extending from the date of establishment of household to the date when a case of tuberculosis brought about epidemiological inquiry, there are many pitfalls in enumeration of former members of the household, however carefully the field work is done. Such data are probably the least reliable with respect to neonatal deaths.

If children under 1 year of age are excluded, it can be seen from Table 5 that the white families of this study, prior to contact, showed a total mortality 1.9 times greater than expected had the city rates prevailed. This is not unexpected, for a public dispensary attracts the poorer white families who live under conditions considerably below those of the average white city resident.

The colored families prior to known contact with tuberculosis showed 48 deaths from all causes during the first year of life, when 69 were expected; and between 1 and 4 years of age 13 children died, when 23 deaths from all causes were expected. If under-enumeration of deaths in early infancy played a rôle in the collection of data from white families, such an effect might be expected in more exaggerated form in the colored where larger households and a higher infant mortality would tax the memory of the informant more severely. It is probable, therefore, that under-enumeration played a considerable rôle in the unexpectedly low mortality recorded for colored chil-

TABLE 5

Observed and Expected Deaths from All Causes in White and Colored Tuberculous Families Before and After the Onset of Known Contact

	Before Known Contact			*After Onset of Known Contact*		
	Deaths		*Ratio of Observed to Expected*	*Deaths*		*Ratio of Observed to Expected*
Age	*Expected*	*Observed*		*Expected*	*Observed*	
			White			
0– 1	32.26	27		12.22	8	
1– 4	8.15	16		5.60	14	
5– 9	1.38	4		2.10	6	
10–14	0.49	0		1.05	0	
15–19	0.29	0		0.78	4	
1–19	10.31	20	1.94	9.53	24	2.52
0–19	42.57	47		21.75	32	
			Colored			
0– 1	69.20	48		16.29	16	
1– 4	23.32	13		8.82	28	
5– 9	3.35	3		2.70	4	
10–14	1.76	3		2.25	2	
15–19	1.69	1		2.53	9	
1–19	30.12	20	0.66	16.30	43	2.64
0–19	99.32	68		32.59	59	

TABLE 6

Observed and Expected Deaths from Tuberculosis in White and Colored Tuberculous Families Before and After the Onset of Known Contact

	Before Known Contact			*After Onset of Known Contact*		
	Deaths		*Ratio of Observed to Expected*	*Deaths*		*Ratio of Observed to Expected*
Age	*Expected*	*Observed*		*Expected*	*Observed*	
			White			
0– 1	0.334	0		0.104	2	
1– 4	0.452	0		0.283	4	
5– 9	0.061	0		0.070	1	
10–14	0.033	0		0.043	0	
15–19	0.071	0		0.140	3	
1–19	0.617	0		0.536	8	
0–19	0.951	0		0.640	10	15.6
			Colored			
0– 1	1.536	1		0.380	8	
1– 4	3.235	2		1.423	15	
5– 9	0.822	2		0.650	4	
10–14	0.658	2		0.906	2	
15–19	0.930	1		1.408	8	
1–19	5.645	7		4.387	29	
0–19	7.181	8	1.11	4.767	37	7.76

dren under 1 year of age prior to contact; and it is altogether possible that this error was extended, and operated to a lesser degree in the record of deaths from all causes for children aged 1 to 4.

Excluding children under one year of age, it is found on referring to Table 5 that prior to contact the observed mortality from all causes in the colored was two-thirds that expected had the city rates prevailed. This difference between expected and observed number of deaths is not quite large enough to exclude the operation of chance alone; and it is possible that the figure for observed deaths represents a chance variation from city experience. If the difference is real, and under-enumeration plays no significant rôle beyond 1 year of age, then the colored of our series prior to contact appear to have represented a standard of living and a risk of mortality somewhat more favorable than the average colored family of the city of Baltimore.

Subsequent to the onset of intra-familial contact with pulmonary tuberculosis, the observed total mortality for ages 1–19 becomes more than twice that expected at prevailing city rates. It will be seen from Table 5 that for white families the ratio of observed to expected deaths from all causes rises from 1.94 before known contact to 2.52 after the beginning of contact, an increase of only 30 per cent in the ratio. In contrast to the white, the colored families show a marked increase in the ratio of observed to expected mortality following the establishment of exposure to tuberculosis. The number of deaths from all causes observed for the colored, aged 1–19, subsequent to contact, is 2.64 times greater than the number of deaths expected at city rates. If the ratio of 0.66 prior to contact is correct, then the ratio of observed to expected deaths, after contact began, is 4 times greater, representing a 300 per cent increase. Even if we suppose a pre-contact ratio of 1 to be more nearly correct, the increase in observed mortality over that expected, as indicated by the ratio, remains striking.

Thus in measuring mortality from all causes in these tuberculous households, it has been assumed that the relationship between familial hazard and community hazard should remain constant both before and after the beginning of contact, unless tuberculosis within the family upsets this relationship.

Turning to mortality from tuberculosis in these households, it will be seen from Table 6 that prior to contact less than 1 death from tuberculosis would have been expected at prevailing city rates in the life-experience of children of the white families up to age 20. No deaths from tuberculosis occurred. In the colored from birth to age 20, 7 deaths from tuberculosis were expected and 8 occurred. Because there is no evidence for under-enumeration of deaths from tuberculosis in early infancy, the ratios of observed to expected mortality from tuberculosis, before and after exposure began, have been calculated for the whole of the first 20 years of life and are shown in Table 6.

After the establishment of known contact, white children under 20 years of age suffered 10 deaths from tuberculosis when only 0.6 death was expected. Thus the observed mortality from tuberculosis, once contact began, was 15.6 times greater than the community mortality from tuberculosis.

In the colored families 37 deaths from tuberculosis were observed subsequent to contact and only 4.8 were expected, the observed mortality being 7.8 times greater than that anticipated, had the city rates been in force. The lower ratios of observed to expected deaths from tuberculosis for the colored, as shown in Table 6, are due solely to their higher community attack rate from

tuberculosis, which increases the number of expected deaths forming the denominator of the ratio.

In conclusion, this study of mortality in 138 white and 147 colored families exposed to tuberculosis indicates that while the death rates from tuberculosis are strikingly increased over normal expectancy in both races, tuberculosis mortality in the white children of our series was not sufficiently high to increase in a marked way the total mortality from which such families already were suffering. The colored children, however, have a mortality from tuberculosis three or four times greater than the white, once exposure has been established, and these deaths from a specific cause are numerous enough to increase very greatly the total mortality in these families. These racial comparisons indicate that familial contact with tuberculosis is much more serious for the colored than for the white. It follows that departments of health can afford to focus their attention more sharply upon prompt provision for the tuberculous adult of the colored race in order that his familial associates may have an improved opportunity to escape the disease which remains the leading cause of death in the colored race.

NOTE: The author acknowledges gratefully her debt to the late Dr. W. H. Frost, who planned the study and guided much of the analysis. The present paper represents an extension of a preliminary unpublished compilation made by Dr. James Watt at the School of Hygiene and Public Health in 1936.

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ADMINISTRATIVE CONTROL OF STATE HEALTH DEPARTMENTS

THE usual position of the state health department in the framework of state government is both appropriate and unique. Since these departments are vested by law with wide authority over communities and individuals, they are generally responsible to the chief executive of the state, and through him to the people.

This system has been in successful operation since the organization of the first state board of health in 1869. In most instances, state health departments consist of a board of health or council appointed by the governor, and an executive state health officer who is appointed in about half the states by the board, and in the remainder directly by the governor. In either event, the chief executive properly shares the responsibility for the efficient administration of the public health activities of the state.

In recent years there has been an unfortunate tendency in some states to place the health department or the health officer under the administrative jurisdiction of another state department, such as social welfare. Almost invariably the effects of such an unwise procedure are detrimental to the best interests of public health work, since the submergence of the health department in another executive branch of the government removes desirable contact with the governor and tends to minimize the real importance of an effective state health program.

In an official declaration on desirable standard minimum functions and suitable organization of health activities, the American Public Health Association has emphasized the principle that, " the state or city health officer should be directly responsible either to his board of health, or to the chief executive of the governmental area concerned." [1]

It has been aptly stated that government is organized for the purpose, among others, of safeguarding the health of the people, and that the protection and preservation of the public health has been recognized from time immemorial as one of the necessary duties and primary functions of the state.[2] In order that

this important governmental responsibility may be discharged most efficiently, it is essential that every state health program should be administered by a competent, independent executive department of the government, amenable only to the chief executive of the state.

Legislative proposals for any system other than this are unwise and should be vigorously opposed.

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SUMMER DIARRHEA AND HORSE-DRAWN VEHICLES

PUBLIC health is sometimes promoted by trends or measures in which that objective was not considered. A striking instance is the reduction of malaria in Missouri, Arkansas, and other states, where huge drainage ditches have been put down to reclaim land for agricultural purposes. It is said that in southern Illinois, where somewhat the same process has been going on, the quinine bottle was once put on the table as regularly as the sugar dish, yet even for teaching purposes one cannot count on material in some districts in which malaria was formerly prevalent.

Graham-Smith has been studying the relation of horse-drawn vehicles to summer diarrhea in England. In 1929, he drew attention to the decrease in deaths from summer diarrhea of infants and attributed this to the increased use of automobiles and accompanying decline in horse-drawn vehicles. He supplements his former findings in a report [1] so extensive and exact as to leave little question of the relation of the decline in summer diarrheas to the falling off in the number of horse-drawn vehicles, and the consequent accumulations of horse manure as breeding places for flies.

The observations cover 37 years, at the beginning of which horse manure was stored even for weeks near urban stables, while at the end owners were compelled to remove it and other refuse promptly. A chart shows for 1901–1937 the departures of the mean air temperature in the third quarter of each year from the average for 50 years (1861–1910), which are correlated with the number of horse-drawn vehicles licensed 1929–1939, and the death rate from diarrhea of children under 1 year of age per 1,000 live births for England and Wales from 1901 to 1905, and from 1929 to 1939. While there was great fluctuation in the death rate during the period 1901–1922, except for 4 years, both the rises and the falls corresponded with the mean air temperatures of the third quarters of the year, but from that time on the decline in the death rate corresponded closely to the decline in the number of horse-drawn vehicles. From 1906 to 1937 the number of horse-drawn vehicles licensed fell from 411,334 to 14,195, the fall being even more rapid than the death rate. During the same time the motor vehicles increased from 67,115 to 2,706,555.

At the beginning of the period under observation (1901–1905) the death rate from summer diarrhea in children under 1 year of age per 1,000 live births was 25.4, and for the last five years (1933–1937) 5.3. In 7 of the last 16 years conditions were very favorable for fly breeding, yet there was little evidence of any effect on the spread of summer diarrhea.

The prevalent opinion practically all over the world was that high temperatures were responsible for intestinal troubles, and Mellanby, in 1916,[2] as the result

of an experimental investigation of the subject, felt that the high temperature in itself might be the cause of the disease.

In commenting on the situation, Graham-Smith says that previous to the outbreak of the World War in 1914, little attention had been paid to the possibility of the dissemination of disease through flies, and attributes the recognition of their agency to observations made where large numbers of horses were gathered for army purposes. This is somewhat surprising since the agency of flies as vectors of intestinal diseases, notably typhoid fever, was recognized in 1898, during the Spanish-American War, and the name "typhoid fly" was given. A commission consisting of Walter Reed, Victor C. Vaughan, and W. O. Shakespeare, with Reed as Chairman, was appointed to investigate the origin and spread of typhoid fever in the military camps. The report,[3] drafted largely by Victor C. Vaughan, consisting of two volumes, was published in 1904, and sent to the War Department of every country in the world. Further, Dr. Christopher Childs came from England, studied the material, and Vaughan acknowledged his valuable advice and assistance in preparing the report.[4] While all camps in which typhoid fever appeared were studied, the greatest amount of evidence was gained from the epidemic at Chickamauga.

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A NEW STUDY OF ALCOHOLISM

ALCOHOL and alcoholism are again attracting expert study. After a period of relative quiescence the subject has again been brought to the fore. In spite of the scientific, sociological, and other studies that have been made of alcohol over many years, it seems that there are still many questions about which we know little and other phases of the problem which are highly controversial. In 1932, to mention only one, a volume [1] appeared, written by 23 authors, which presented the known facts about alcohol in its biological and human relationships, since the texts in physiology, hygiene, and the health, and the courses based on them in schools were unsound and not in accord with the best interests of the pupils or the community. It was hoped that this knowledge would help to clear up the "muddled thinking, emotional floundering, and political propaganda" so as to determine a national policy dealing with the liquor question.

We now have the announcement of the Research Council on Problems of Alcohol which proposes to go over much of the same ground again. This Council includes scientific men, physicians, business men, educators, and public health officials. It claims to have no bias in respect to the use of alcohol, and its only object is to obtain the truth about alcohol and give it to the public whatever that truth may be. The Scientific Committee is made up of 34 men, while the Executive Committee has 16, in addition to which there is an Advisory Committee of 5. Some members of the Scientific Committee wrote for the book published in 1932, and altogether the personnel of the three committees gives assurance that the study will be thorough, covering every angle of a much discussed and vexed question which for ages has perplexed many of the nations of the world. "The

ultimate objectives of the Council are the cure and prevention of alcoholism and the alcoholic psychoses."

Attention has been called to the treatment of alcoholism as a public health problem and it has been classed with tuberculosis and syphilis as one of three of the major problems of public health today.[2]

Almost at the same time that this Council issued its preliminary announcement comes the statement from Allied Youth, Inc.,[3] calling attention to the fact that young people today find themselves in a difficult position as to drinking since the use of alcoholic beverages is increasing and it is held by many to be "the thing to do." It is claimed that inquiries so far indicate that nearly one-half of the members of senior classes in high schools and more than one-half of all young people are drinking, while in the larger universities and colleges the majority of students are using liquor. Allied Youth, Inc., is interested in education concerning alcohol in high schools, colleges, and communities.

There can be no question of the importance of these movements. We wish for both the success which their motives deserve. We need all the information possible on every aspect of alcohol and its use, and the facts should be widely taught without emotionalism or bias.

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TRANSFER OF THE PUBLIC HEALTH SERVICE

A SHORT time ago we called attention to the transfer of the Public Health Service to the Federal Security Agency. On April 11, 1940, the President sent to Congress Reorganization Plan No. IV which transferred to the Federal Security Agency from the Interior Department, St. Elizabeths Hospital, Freedmen's Hospital, Howard University, and Columbia Institution for the Deaf.

More important perhaps from the public health standpoint was the transfer to the same Agency of the Food and Drug Administration with the exception of two activities intimately related to the work of the Department of Agriculture, the Insecticide Act of 1910, and the Naval Stores Act. The Food and Drug Administration will function as a separate unit under the Federal Security Administrator and the chief of the administration will be known as the Commissioner of Food and Drugs.

These changes are in line with the plan which has been advocated by the American Medical Association for quite a time tending toward the establishment of an agency in the federal government under which all medical and health functions of the federal government except those of the Army and Navy will be coördinated and administered.

BOOKS AND REPORTS

International Health Division, The Rockefeller Foundation: Annual Report, 1938. *New York: Rockefeller Foundation,* 1939. 233 pp.

The activities of the International Health Division of the Rockefeller Foundation are published each year in a separate account for readers with a specialized interest in the field of public health. As has been the custom in former years, emphasis has been given to such laboratory and field work as might lead to the development of methods of dealing with public health problems which were at the same time better, more efficient, and more economical. Research studies carried out in close collaboration with field work are given considerable attention in this report. The field work was conducted in selected areas in various parts of the world where the Division has been asked to coöperate and where opportunities have been provided for promising work. During 1938 these areas included 12 states of the United States and 37 foreign countries.

The program falls into three groups: problems of the control of specific diseases, activities in relation to departments of health engaged in health demonstration work or the organization of permanent new lines of public health activity, and public health education through support given to selected schools and training centers. Concluding the report is in itemized table of expenditures for the year. Several photographs supplement the text and to each chapter is added an important bibliography.

Refinements of centrifuge technic were utilized in virus studies to reveal some of the physical properties of the virus particles, utilizing the animal titration and ultra-violet photography methods. The new advances in electrophoresis apparatus and methods developed in Sweden were studied and the technics found applicable to the investigation of virus and antiviral substances. Studies of specific diseases included yellow fever, influenza, tuberculosis, syphilis, rabies, worm diseases, Rocky Mountain spotted fever, sylvatic plague, scarlet fever, and malaria. The eradication of yellow fever from the Americas by collaborating in the organization of antimosquito campaigns in leading urban and rural areas of endemic infection was fairly successful, but it was realized that jungle fever flourishing in several South American areas presented a more difficult problem. Today this is met by three types of activity. Postmortem viscerotomy for diagnosis on all patients dying less than 11 days after the onset of any febrile illness, and antimosquito measures have assisted in the clearing of urban areas. But jungle fever control necessitated the widespread use of individual immunization of exposed populations and 1,059,252 persons were so vaccinated in Brazil during 1938 with satisfactory results. The properties of this virus vaccine were closely investigated to rule out the possibility that the strain might revert to the pathogenic form by further mosquito-human transfers. It is pointed out that the monkey and not man is responsible for maintaining the virus, and vaccination will not bring an end to the disease entity. Several other mosquito vectors of the disease have been discovered, and it is apparent that important unsolved problems exist in our understanding of yellow fever since

it occurs under a wide variety of natural conditions and is thereby subject to many variations.

Intensive and continued observations of the members of over 500 tuberculous families begun in 1933 were completed in 1938. Steps looking to the further development of the Kips-Bay-Yorkville health center with the aims of the establishment of a model tuberculosis clinic, the instruction of physicians, nurses, and medical students, and the conduct of epidemiological studies were initiated.

An epidemiological study in the Eastern Health District of Baltimore was undertaken in mid year to ascertain the humeral immunity to syphilis and continue further spirochetal studies. Protective substances against *Treponema pallidum* were found in the serum of persons long afflicted with the disease which is similar to that produced experimentally in rabbits. The question is raised as to the use of a possible serum protective substance rise as a means of differentiating the various strains of *Treponema pallidum*. The basic problem of accurate measurement of the prevalence of syphilis in a community in studying the epidemiology of the disease is stressed. The International Health Division helped the expansion of the syphilis control program with financial grants for postgraduate study.

Rabies, worm diseases, spotted fever, sylvatic plague are more briefly discussed. The fact that *Pasteurella pestis* could not be found in several thousand wild rodents and rodent fleas investigated in Western United States and Canada does not warrant a relaxation of vigilance it is pointed out, and repeated sampling is needed since periodic outbreaks have been known to occur.

Studies related to scarlet fever in 1938 have been directed chiefly toward the collection of data concerning diagnosis, treatment, and the work on antistreptolysin. Over 3,000 new strains of B hemolytic streptococci were isolated bringing the total to 7,562 strains. Increased prevalence in 1938 facilitated the threefold task of typing the streptococcal agent, and studying the preepidemic and epidemic community. The existence of atypical clinical cases during an epidemic is mentioned.

Public health administration was studied in several states and recommendations were made to state legislatures. Similar work was carried out in Mexico. The vital statistics branch of Manitoba, Canada, Health Department was aided in its morbidity and maternal mortality study to pave the way for a maternal hygiene program. Epidemiology, sanitary engineering hygiene and nutrition, and industrial hygiene constitute the branches aided. Local health department work was developed in many localities and valuable assistance rendered to provide additional staff, develop educational programs, establish and maintain health units, expand diagnostic, immunological and treatment work, and in general to help attain the goals of the local program. Surveys of medical care in foreign villages were made, and often the governments in question acted promptly on the Division's recommendations.

"Essential to the success of the Division's program is the presence of well chosen and trained personnel in each field, to help in organizing and to carry on when the Division aid is withdrawn." To encourage this public health education the Division provided numerous fellowships to properly qualified persons. Training centers have been planned in 5 districts to be operated in conjunction with 5 leading New York City medical schools. Grants were made to the World's Fair exhibits. Other institutes and schools of hygiene and public health aided included those at Stockholm, Johns Hopkins, field training units at Harvard and Tokyo, Sofia,

Ankara, Athens, Budapest, and Calcutta. Aid to education of public health nurses is reviewed since its commencement in 1920 and great advancement after the world war. In addition to grants to regular schools of nursing, aid has been given to the Henry Street Settlement and East Harlem Nursing and Health Service of New York City and to health centers in many parts of the world. Special grants were made to schools of nursing at Toronto, Canada, and Zagreb, Yugoslavia, and to a school of midwifery at Peiping, China. Many fellowships and travelling grants were also allocated. IRA V. HISCOCK

The Kosher Code of the Orthodox Jew. *Being a literal translation of that portion of the sixteenth-century codification of the Babylonian Talmud which describes such deficiences as render animals unfit for food (Hilkot Terefot, Shulhan Aruk); to which is appended a discussion of Talmudic anatomy in the light of the science of its day and of the present time—By S. I. Levin and Edward A. Boyden. Minneapolis: The University of Minnesota Press,* 1940. 243 pp. Price, $4.50.

While examining some 10,000 livers in the abattoirs around Boston, one of the authors, Dr. Boyden, learned from "kosher cutters" that such anomalies as he was looking for were described in the *Babylonian Talmud* (Venice, 1564), hence his interest in the present translation. The reviewer's interest in the subject was awakened by service on two boards of investigation of slaughterhouse practices in the United States, one just after the appearance of *The Jungle*, by Sinclair Lewis, and one during the administration of President Woodrow Wilson. Fairly extensive correspondence and interviews strengthened the interest but not until the appearance of this book has the matter been presented fully and clearly. Indeed, the Laws of Terefah * have been translated into a modern language—French—but once before (1898), by Pavly and Neviasky, and then only from the standpoint of comparative religion, yet they are full of interest from many standpoints, though for the purpose of this review, those concerning public health are preëminent.

There is a Preface by one author, Professor of Anatomy of the University of Minnesota, and an Introduction by the senior author, the Senior Orthodox Rabbi of Minneapolis. In these, two points of view are represented. Rabbi Levin hopes the translation will be of use not only to theological students but to those who are interested in the dietary laws and their origins in the culture of ancient Israel. The Preface shows interest chiefly from the standpoint of the anatomist, though public health is not forgotten. Upon the myriads of animals examined over some 2,000 years for conditions which might make them unfit for food, many anatomical observations have been made, and it is curious that anatomists in general have paid so little attention to this accumulation of valuable anatomical knowledge. In a review of such an unusual book one is tempted to quote at too great length.

Perhaps the greatest single contribution made by the Jewish inspectors concerns the gross anatomy of the surface of the lung. In the 3rd and 4th centuries these men were the first to record correctly the number of lobes and to anticipate their conception as outgrowths from a stem bronchus. The first description of the cauda equina was by the physician Samuel (3rd century) more than a thousand years before the classic work of Andreas Laurentius. They also noted adhesions, exudates, and nodules, some of which it seems impossible not to regard as lesions of tuberculosis.

* Terefah, torn by wild beasts; hence ritually unfit.

The digestive system was well described, and from the Jewish terms we have our present word "omasum." We owe to them the earliest accounts of the duplication of the intestines and the cloacal vents of birds. The *Talmud* also gives one of the earliest descriptions of young human embryos. There are many first accounts of duplication of organs and anomalies.

We are told why animals for food must be killed by bleeding (Lev. 1:5), and the reasons for rejecting carcasses under various circumstances are clearly explained. Of interest is the rejection of the hind quarters of animals, based on the story of Jacob, who wrestled with a man at Penuel. The man prevailed against him only by touching the hollow of his thigh, and Jacob ever afterward "halted upon his thigh." "Therefore the children of Israel eat not of the sinew which shrank, which is upon the hollow of the thigh, unto this day: because he touched the hollow of Jacob's thigh in the sinew that shrank" (Gen. 32:24–32).

From the practical standpoint the Jewish inspection is in some ways more thorough than that done by official inspectors in the slaughterhouses of the country. In every large city there are shops in which the parts rejected by the Jews can be bought, and one can be sure of a well inspected carcass when buying this meat.

The preparation of the animals for slaughter is painful and repulsive, and the reviewer has frequently seen several animals strung up by one leg for an unnecessarily long time undergoing physical torture as well as terror. This is more surprising since so much stress is put on avoiding cruelty to animals. The killing is done with a keen edged knife which usually severs both carotids and both jugulars as well as the trachea. The eyes glaze instantaneously. The slaughterer then feels the edge of his knife and if it is rough, the carcass is rejected, the reason being the alleged suffering of the animal. Where the animals have horns the head is held by a slaughterhouse attendant with the throat up. At present, since horned animals are not seen to a great extent, a box-like structure of galvanized iron is thrust over the muzzle of the animal so that the head can be twisted into place and held while the throat is cut.

The Table of Contents takes up the Laws of Terefah in sections, and the subheadings are so numerous and descriptive that in a few pages one gets the scope of the book. The Appendices give: (A) a Glossary of Hebrew Terms; (B) Rabbinical Authorities Cited; (C) Index of Scriptural and Talmudic Quotations; and (D) General References, in addition to which there is a good general index.

The book should have a place in every medical library and, according to Rabbi Levin, in the library of theological schools. The subheading of the title tells exactly what the book is. Of especial interest are the appended notes by Rabbi Levin which bring the code up to the practices of the present day, "so that it stands as an authentic guide to observers of the orthodox law."

In the review of the book, the advice of Professor Isadore Keyfitz, Professor of Semitic Languages, History and Institutions and Old Testament, University of Missouri, has been of much value, and is gratefully acknowledged.

MAZÝCK P. RAVENAL

Migration and Social Welfare: An approach to the problem of the non-settled person in the community—*By Philip E. Ryan. New York: Russell Sage Foundation*, 1940. 114 pp. Price, $.50.

The practical woodsman, when forest bewildered, climbs a high tree, from which, above the undergrowth, he may determine obscure home trails. This publication offers a similar panoramic

service to those who seek egress from the tangle of opinion and discussion of social, economic, and political phases of transiency and migration. Amidst much sophism, and even commercialized emotionalism, a calm and compact analysis of migration cycles, of their causes and consequences, and of the various proposals and experiments for alleviating their impacts, contributes a rational perspective of a national social phenomenon which has become particularly aggravating during the past decade.

The topical bibliography of twelve pages indicates the range of Mr. Ryan's investigation. It also illustrates the protean aspects of modern nomadism and should afford meditation for self-appointed oracles who proffer symptomatic rather than organic treatment.

JOHN J. SIPPY

Modern Diabetic Care—*By Herbert Pollack. New York: Harcourt, Brace,* 1940. *216* pp. Price, *$2.00.*

Modern Diabetic Care is in two parts, one from the strictly medical angle discussing the history, symptomatology, and the treatment of diabetes, the other devoted exclusively to nutrition and dietary preparations. The second part is written in collaboration with Marie V. Krause, Teaching Dietitian at the New York Hospital.

This book is well arranged and readable for the average diabetic. There are several chapters of an advisory nature such as—dealing with the young diabetic and his occupations; advice on pregnancy and general problems that might occur. The chapter on insulin is a very helpful one for the diabetic as it goes into the minutest details covering self injection. However, the information on the self regulation of the *insulin dosage* as given is confusing and should be left to the doctor alone.

The nutritional and dietary part and the tables in the appendix are routine necessities in all such books. The discussion on emergency diets, food budgets and recipes are to the point. The reader's attention is also drawn to the canned food problem.

The description on how to prevent the complications in diabetes is of interest to public health workers. It includes care of the skin, feet, teeth and mouth, as well as care in mental hygiene. Because of the simplicity in the presentation of this material and the many preventive and hygienic suggestions, this book is recommended for lay consumption and those public health workers who come in contact with diabetics.

MORRIS ANT

Manual of Water Quality and Treatment—*Prepared and published by The American Water Works Association,* 22 East 40 St., New York, N. Y., *1940.* 294 pp. Price, *$3.00.*

This is a compendium of current North American water treatment practice prepared under the auspices of the Committee on Water Works Practice of the American Water Works Association. The following topics are discussed:

Characteristics of Available Sources, 6 pp.
Organisms in Water, 6 pp.
Standards of Quality, 34 pp.
Purification Occurring in Streams, Lakes, and Reservoirs, 23 pp.
Partial Treatment and Treatment Preliminary to Filtration, 42 pp.
Coagulants and Coagulation, 21 pp.
Chlorine and Other Chemicals, 28 pp.
Tastes and Odors, 8 pp.
Filtration, 35 pp.
Chemical Conditioning of Waters, 62 pp.
Treatment Plant Control, 8 pp.

The book is thoroughly up-to-date, well written, and has been carefully edited by well known experts in the field. The typographical set-up is excellent. A consolidated bibliography is given at the end. The volume is one which should be of value not only to the practising engineer but also to health officials and others interested in water supply and water purification.

LANGDON PEARSE

Virus and Rickettsial Diseases, With Especial Consideration of Their Public Health Significance: *Harvard School of Public Health Symposium Volume—By various authors. Cambridge: Harvard University Press,* 1940. 907 pp. Price, $6.50.

The volume at hand is the outgrowth of a summer symposium at Harvard University in 1939. Throughout the presentations sum up the knowledge of the day—perhaps we had better say "the knowledge as of June, 1939," since progress in these fields leads to rapid changes in our conception of many features of infectious diseases.

One turns to specific items and finds set forth many current views of interest; a few examples will illustrate. Gordon tells us that "our present knowledge of viruses would indicate that certain of them are living corpuscles, while others are crystalline" (p. 11) and considers the crystals "probably inanimate."

Gordon (p. 23) suggests the convalescent carrier state as being of more significance than is generally believed. He points out that in transmission by arthropods the vector may serve to propagate the virus or may act as a mechanical carrier (p. 24). Gordon considers latent infection to be identical with the preclinical phase (p. 47) or, as we usually say, with the incubation stage or that following recovery—the convalescent carrier state.

Mueller (p. 71) in considering certain essential properties of virus presents a chart (from Stanley, 1938) which visualizes the relative sizes of certain viruses, certain rickettsia bodies, and of certain bacteria and red blood cells.

Simmons gives a very full discussion of insect vectors of human diseases, and it is interesting to note that he considers insect transmission of poliomyelitis as definitely coming within the range of further study (p. 161).

General Russell leans to the view (p. 188) that the two types of smallpox with which we are familiar represent different strains, and mentions that Chapin (of Providence, Rhode Island) could not convince himself that there was any crossing over from one type to the other. Although the subject is "Epidemiology and Control of Variola" no mention is made of any effort at control beyond general vaccination—an omission that will be disappointing to a health officer serving a community that includes large numbers of anti-vaccinationists.

Robinson (p. 214) in discussing preparation and use of smallpox vaccine gives scant encouragement to those who would replace the time-honored fruit of the calf by a vaccine prepared by another method.

McKhann (p. 273) places, for practical purposes, the period of communicability of measles from the beginning of prodromes to the end of the fading of the rash. His well known views on prophylaxis by the use of Immune Globulin (placental extract) are fully developed.

Wesselhoeft, in a discussion of the encephalitides of mumps, distinguishes a specific one due to mumps virus and (p. 337) considers that this may activate a more serious secondary encephalomyelitic infection.

Nelson (p. 366) prefers the name *Lymphogranuloma inguinale* over the more recently proposed name *Lymphopathia venereum.* He appears to regard the Frei test more highly than some recent reports suggest. No reference is made to the great frequency of the disease in southern communities.

Mote (p. 423) considers epidemic influenza a "symptom complex, that is, an epidemiologic phenomenon and not a specific etiologic entity"—indisputable in the light of our present knowledge.

McKhann (p. 596) in discussing convalescent serum in the prophylaxis of

poliomyelitis answers, in the negative, the question of the value of the serum.

Aycock undertakes the problem of presenting and appraising preventive measures in poliomyelitis and, after reviewing the various measures which have been tried (p. 613), decides that none have been found of value.

Kelser (p. 649) in considering the problem of when to administer the prophylactic treatment against rabies, takes a wisely conservative attitude in the case of persons who have had contact with a rabid animal but have suffered no injury: He recognizes the doubtful value of general vaccination of dogs. Though the volume is not intended for the practitioner of medicine one would have appreciated a discussion of so-called " First Aid Treatment " where persons have been bitten by rabid animals.

Fothergill (p. 680) in considering prevention of naturally acquired equine encephalomyelitis in man regards protection from mosquitoes as the important factor.

The last part of the book deals with rickettsial diseases, defined by Wolbach (p. 789) as " self-limited specific infectious diseases transmitted by arthropods and characterized by continued fever and a rash."

Pinkerton dwells on the difficulties in diagnosis between members of the group (p. 822) even when histopathologic studies are possible and notes the occasional necessity for resort to animal inoculation and cross-immunity tests.

Gordon (p. 837) in considering the diagnosis of typhus, mentions the aid to be derived from cupping which brings the rash out in typical form.

Zinsser (p. 884) believes that either murine typhus, or classic European typhus, may be either endemic or epidemic. He regards Brill's disease as classical (p. 885) imported typhus endemic in cities with a large immigrant population.

In reviewing such a volume the reader naturally pays special attention to subjects with which he is personally familiar or in which he has a special interest, and that has been done in this instance.

For each subject discussed the book provides a liberal list of references. The volume will be indispensable to specialists in the fields covered and will be of value to all interested in infectious diseases. G. W. McCoy

Rural Health Work in Hungary—*By B. Johan. Publication No. 9 of the State Hygienic Institute of Hungary. Budapest: Royal Hungarian University Press,* 1939. 230 pp.

In this volume Dr. B. Johan, Undersecretary of State, describes the activities of the Hungarian State Institute of Hygiene, the establishment of which was promoted by the Rockefeller Foundation. The book covers the organization, methods of work and achievements of the Institute's program for rural health work, with special emphasis on preventive health services. It includes material on vital statistics, personnel, administration, and all of the Institute's basic activities in the field of public health.

The nature of the material varies from such a statement as " The nurse should never forget that in a small place everything is always known about everybody " to such a thought-provoking statement as the indication that a person's nutrition is classified as " satisfactory," " if there is in the weekly menu 4 times milk, once meat, and once vegetables or fruits." Because of this unevenness and because of somewhat unconventional English usage, the book requires more than a casual perusal for the sifting of significant facts. The public health worker will find an interesting contrast between the rural health problems presented and those with which he is more familiar. C. E. TURNER

Cases of Syphilis Under Treatment, Cuyahoga County, March, 1939—*By Howard Whipple Green, Joint Social Hygiene Committee of the Academy of Medicine and the Cleveland Health Council. Cleveland, Ohio,* 1940. 49 pp.

In coöperation with 1,556 physicians and 21 institutions in metropolitan Cleveland, the Joint Social Hygiene Committee presents an analysis of data relating to patients treated for syphilis during March, 1939. In this, their third report, the committee again answers questions of paramount interest as to the extent of syphilis under treatment, whether the treated case is infectious or non-infectious, whether it is a new or an old case, and whether treatment is administered by the physician or in the institution. Although recently the emphasis formerly directed toward complete treatment of all cases of the disease has been shifted toward the goal of reaching the contacts, it is emphasized that active infectious cases already under treatment must not be allowed to disappear without first being rendered non-infectious.

The factual data were, as in the former studies, determined by questionnaires mailed to 1,562 physicians and 78 hospitals and institutions in Cuyahoga County. The fact that replies were received from all but 6 of the physicians and from all of the institutions and hospitals makes this report of especial value. A total of 4,319 cases were found to be under treatment, 1,409 under the care of private physicians and 2,910 in institutions. The report is composed of numerous tables and diagrams supplemented by discussion.

Data are presented regarding the incidence of syphilis with reference to sex, age, and race differences, and changes from the March, 1938, study are noted. While the rate for whites decreased, that for Negroes rose, the present rates for the latter being 10 times the white rates. The sex ratio was 50:50 and the 5 year age group with the greatest number of cases was the 35–39 year group. About one-third of all cases are treated by the private physician, 87 per cent of whose cases are white despite the fact that the number of cases in each racial group is approximately the same. The extent of the physician's treatment of syphilis is indicated by the fact that about 27 per cent of those questioned had treated cases during March, 1939, one-half of these having only one or two cases under supervision. Of the infectious cases, 35 per cent were treated by only 12 physicians.

Since syphilis is communicable only in its infectious stage and since prompt treatment will render the disease non-infectious, the success of its control lies in promptly treating the new infectious case and continuing treatment until such time as the case becomes non-infectious.

Only 6 per cent of the 1,409 cases treated by the physicians were new and infectious, only 5 of the physicians treating more than one or two new and infectious cases during the month. The fact that as many as 145 cases of infectious syphilis under treatment are estimated from the data to have failed to report for therapy during March is a matter of real concern to everyone interested in reducing the incidence of syphilis to any appreciable extent, Mr. Green declares. That this condition is improving is apparent since 66 per cent fewer cases treated during the two previous months failed to report during March, 1939, than during the previous test period one year before.

Although facilities for the treatment of the disease in several hospital outpatient departments are still being severely overtaxed by the enormous number of cases under care, the number of infectious cases treated is " surprisingly small." Therefore, the bulk of the load on most institutions is caused by con-

tinued treatment of old cases, most of which are non-infectious. Moreover, since 85 infectious cases treated during the previous 2 months failed to return for treatment in the test month, the author declares "it is vastly more important to those interested in the control of syphilis that these 85 cases be rendered non-infectious by adequate treatment than that treatment be administered to the 2,350 non-infectious cases cared for that month."

GEORGE JAMES

Annotated Bibliography on Incineration, Carbonization and Reduction of Garbage, Rubbish and Sewage Sludge—*Collected and prepared by Project 465-97-3-35—Research in Selected Problems in Sewage Treatment—U. S. Works Progress Administration for the City of New York. Sponsored by Department of Sanitation for New York City. New York: New York University,* 1939. 146 pp.

This is the latest contribution of the WPA's Research in Selected Problems in Sewage Treatment Project for which the late Professor Lewis V. Carpenter was Director.

Beginning with the earliest reference of municipal refuse disposal by burning in 1900 B.C., the items are chronologically arranged up to and including those issued during 1938. Over half of the entries were published since 1930.

The objectives of the bibliography (to cover the history and description of various methods of incineration, to provide data on other municipal refuse disposal processes for comparison with incineration and to compile the entries and indices so that further study is facilitated on selected subjects) appear to have been accomplished.

F. J. MAIER

Teaching Wholesome Living—*By Alma A. Dobbs, M.A. New York: Barnes,* 1939. 304 pp. Price, $2.50.

This interesting book places emphasis upon positive health and the interrelationships of the different aspects of wholesome living. It would be useful as a basis of discussion in teacher groups, in parents' meetings, and by others concerned with school health education. It goes without saying that there will not be complete agreement as to the teachings set forth, but the book stimulates thinking and combines to a remarkable degree fine educational philosophy with practical suggestions for everyday experiences. Its usefulness would have been increased by more careful editing.

One of the strong features is the emphasis on the ability to make wise choices as illustrated by the following quotation:

> The child is unique: he differs from all other life in that in him alone are possibilities for becoming aware of himself and of his power to direct somewhat his behaviors and in a degree to modify the circumstances of his life. His impetus is to seek that by which to grow, but to live successfully he must grow in consciousness of the part he plays in determining his life by the exercise of his power of choice. We do not know the stages in the development of this unique capacity, this consciousness of the self as the center of activity. It is potential at birth and has its rise in the very young child's experience.

The author handles particularly well the evils of the conflict between instruction and any opportunity for practice and also points out the evils of standardized programs without due recognition of the wide differences in individuals. The danger of attempting to force children to grow beyond their normal rate is vividly portrayed: "we cannot push growth, for by trying, as in forcing open a rose bud, we destroy that which we prize."

The original approach used in the book is illustrated by the sections on laughing and crying which are dealt with very directly as two human experiences not often included in health texts. The emphasis is in the right place on

the unity of personality, and we are in complete accord with the attention given to the creation of a happy, joyous atmosphere for the normal, natural growth of students.

The author is a teacher who uses her wide experience to organize the book in a way to make it valuable to those responsible for curriculum making. In part one, fundamental principles of child growth are explained; part two is concerned with the broader aspects of curriculum construction; part three deals with specific phases of the curriculum including a variety of pupil activities and life situations. There are also a supplement and an index covering topics of concern to all teachers and parents. The book is recommended as worthy of careful study and frequent reference.

PAULINE BROOKS WILLIAMSON

Penny Marsh, Supervisor of Public Health Nurses—*By Dorothy Deming, R.N. New York: Dodd, Mead,* 1939. 303 pp. Price, $2.00.

In this sequel to *Penny Marsh, Public Health Nurse* we follow Penny to a large city where she gains further professional experience and training as a supervisor of public health nurses. Her experiences and adventures are numerous—she undoubtedly experiences every possible emergency a nurse in such an organization meets, including an epidemic of influenza. Record keeping, supervising, personal relationships, all are cleverly brought in, so that a girl who has been interested in the public health nursing profession may gain some impression of how much lies before her.

All is not hard work, for Penny lives a fairy princess existence after hours with a bachelor uncle of means, and has her full share of beaux and lovers' quarrels. As the previous book ends with an engagement, we finally have Penny married, but some may wonder whether after only two years as a public health nurse the training is worth while.

Written entertainingly, with the heroine a charming, successful girl, the educational material should prove most interesting to 'teen age girls who are in search of advice on choosing a profession. MARGARET MCC. HISCOCK

The Medical Career and Other Papers—*By Harvey Cushing. Boston: Little, Brown,* 1940. 302 pp. Price, $2.50.

This is a collection of addresses given on various occasions and biographical sketches, all of which have been published elsewhere. The title is that of an address given at Dartmouth College in 1928. The biographical sketches, with one exception, are of men well known by the author. Haller and His Native Town was the author's "first literary venture," written in Berne and published in 1901.

The essays are largely historical but contain a good deal of philosophy, and all of them have some history. The biographical sketches are delightful, especially when the reader has known the subject. Close association, with a naturally observing eye, has fitted the author for the task he has done so well.

Among the addresses, perhaps the outstanding one is "From Tallow Dip to Television," given at the 150th reunion of the Massachusetts Medical Society in 1931. Its one blemish is the fallacy put into the mouth of Dr. Holyoke, the first President of the Society (1781), of attributing to Theobald Smith the elucidation of the connection between strumous diatheses of children and tuberculosis, and showing that they were due to infection from the milk of tuberculous cows. The demonstration of the transmissibility of bovine tuberculosis to human beings was made at the University of Pennsylvania in the Laboratories of the State Live Stock Sanitary Board in 1902. Smith persisted in defending the mistaken idea

of Koch, and it was not until 1905 that he first isolated the bovine bacillus from human tissues.

Altogether, the book is very readable and is a notable addition to the medical history of our times.

MAZŸCK P. RAVENEL

Elements of Statistical Reasoning —*By Alan E. Treloar, Ph.D. New York: Wiley,* 1939. 261 pp. Price, $3.25.

The author attempts to describe and discuss the concepts of statistics by the use of English composition for the most part and without recourse to the mathematical analysis necessary as a background of proof—despite his statement (p. 3) that only in a relatively loose sense may subjectively interpretable words serve as a vehicle of scientific description. Considering the essential limitations of the procedure, he does a good job over a wide range of concepts including such modern items as the t-test, confidence intervals, and z-test for correlation, and Chi-square. One instance of the difficulties due to the limitations is in the treatment of kurtosis (pp. 33, 73) where he speaks of kurtosis as degree of peakedness, degree of curvature at the peak, etc., in a manner that is hardly justifiable scientifically in view of the fact that the isosceles triangle has a smaller kurtosis but a higher and sharper peak than the normal curve of equal standard deviation, and despite the further fact that the measure of kurtosis is derived from the totality of the frequency distribution, whereas his English suggests restriction to the neighborhood of the peak.

The book deals with general statistics rather than specifically with the problems of vital statistics. There are a discussion of adjusted death rates and a comparison of Maine with Montana for 1930, a brief discussion of life tables, and some treatment of sampling variations of rates.

There are a number of unfortunate typographical errors and a number of inaccuracies of statement; for example, when (p. 121) he states that the fluctuations may be justly ascribable to sampling errors although if the reader should routinely compute Chi-square he would find P=.02. In general it must be noted that the spirit of the English school (Pearson, Fisher) is followed rather than that of the continental (Bortkiewicz, Wicksell), with a consequent emphasis on pure chance and a neglect of considerations concerning chance as a cover for all our ignorance including our ignorance of whether the laws of pure chance are applicable to the problem in hand. Incidentally Yule is not cited.

E. B. WILSON

School Health Problems — *By Laurence B. Chenoweth, M.D., and Theodore K. Selkirk, M.D., with a chapter on School Health Administration by Richard A. Bolt, M.D., Dr.P.H. (2nd ed.) New York: Crofts,* 1940. 419 pp. Price, $3.00.

This scientific discussion of health problems in school, in its second edition, has been brought up to date for the use of college classes, for school physicians, nurses, and teachers. A new chapter on Sanitation of the School deals with the school site, heating, lighting, sanitation of pools, and building arrangements. In a second new chapter, important aspects of the Teaching of Health are considered. Useful material is also contained in the appendices, together with valuable reading lists and a glossary. This text has been carefully prepared and should prove equally valuable to teachers and to those engaged in public health work.

IRA V. HISCOCK

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH.D.

Health for Children in School—To create a healthful environment, provide for care of accidents and sudden illnesses, prevent and control communicable disease, set up a graded program of health instruction, encourage health examinations, give special attention to those in need of medical or dental care, and make possible special programs for the handicapped—these are the essentials of the school health program proposed by an important committee. Should be read by all.

ANON. Suggested School Health Policies. J. Health & Phys. Ed. 11, 5:283 (May), 1940. (also) J.A.M.A. (Organization Section) 114, 17:1673 (Apr. 27), 1940.

Where Cancer Strikes—Even with changing age composition taken into account, cancer incidence shows a continuing increase. Cancer of the digestive tract caused about half the deaths. Cancers of all except the buccal cavity and skin (in males) had higher death rates. Other gruesome but important findings are recorded.

ANON. Cancer Mortality in the United States According to Site, by Sex and Age. Pub. Health Rep. 55, 17:711 (Apr. 26), 1940.

Educating Educators about TB—Of all the great number of American colleges, 165 are now attempting to find tuberculosis among their students. The story of the variety of efforts being made to induce the others to do something makes this an interesting and valuable document.

ANON. Ninth Annual Report of the Tuberculosis Committee, American Student Health Association Journal-Lancet (Minneapolis) 60, 4:178 (Apr.), 1940.

Lay Misinformation about Cancer—Is cancer curable? Is it contagious? What causes cancer? Do you know any symptoms? Is it shameful? Which disease is the most serious health menace? These questions asked recently, and a year ago, indicate that educational progress is being made but the need for greater effort is emphasized by public misinformation. Many still believe that aluminum cooking utensils cause cancer.

ANON. The Need for Intensive Educational Campaigns in Cancer Control. Pub. Health Rep. 55, 15, 653 (Apr. 12), 1940.

About Rabbit Fever—Here you will find an excellent statement about tularemia all ready for you to use in your news item, handbill, bulletin, radio talk, or whatever publicity medium you may want to employ next fall.

ANON. Tularemia. Pub. Health Rep. 55, 16:667 (Apr. 19), 1940.

Advice to Mothers—Here is applied common sense in the care and feeding of young school children. A fine example of parent education.

BAUER, W. W. Health and Happiness. National Parent-Teacher, 34, 9:29 (May), 1940.

What to Eat and Why—You will discover an excellent summary of our present-day knowledge of the important vitamins of human significance in this article written for nurses. Appended is a table showing probable requirements, functions, effects of deficiency and chief sources of each.

BECKER, J. E. The Vitamins. Am. J. Nurs. 40, 5:507 (May), 1940.

Many Children Still Die of Diphtheria—In 1938 more than 30,000 cases and 2,600 deaths from diphtheria were recorded in this progressive land of ours. Maps showing county rates tell dramatically where the children are allowed to sicken and die.

DAUER, C. C. Geographical Distribution of Diphtheria Mortality in the United States. Pub. Health Rep. 55, 15:622 (Apr. 12), 1940.

Malignant Growths and Cancer Deaths—Some revealing diagrams of cancer incidence and deaths by sites, by age grouping, color, etc., illustrate this analytical study from Chicago.

DORN, H. F. The Incidence of Cancer in Cook County, Illinois, 1937. Pub. Health Rep. 55, 15:628 (Apr. 12), 1940.

A Close Watch on TB—When a group of people, originally non-tuberculous, were studied over a period of years it was found that tuberculosis developed about as frequently in those with negative chests as in those showing a healed primary infection. Many cases may go long unrecognized unless a fluoroscopic examination is made.

FELLOWS, H. H. Serial Chest Roentgenograms of 3,179 Office Employees, 1926–1938. J. Indust. Hyg. & Toxicol. 22, 5:157 (May), 1940.

Modern Treatment of Pneumonia—Almost all of us must be interested in the present status of pneumonia treatment even if only casually. Here you will find an excellent discussion of the place of sulfapyridine and immune serum in the different stages and kinds of pneumonia cases.

FINLAND, M., *et al.* Clinical and Laboratory Studies on the Use of Serum and Sulfapyridine in the Treatment of Pneumococcal Pneumonias. New Eng. J. Med. 222, 18:739 (May 2), 1940.

Kindness to Eyes Department—All "daylight" lamps or filters do not produce good synthetic light. The optimum intensity of light differs with the individual and the particular kind of ocular defects he enjoys. In reading 10 pt. type most people prefer less than 15 foot candles of light. Age and nearsightedness have a lot to do with light requirements. There is a great deal more about lamps, paper, etc. You will learn here that flat black ink on white mat paper is best.

FERREE, C. E., and RAND, G. Optimum Working Conditions for the Eye. Sight-Saving Rev. 10, 1:3 (Mar.), 1940.

Herpes, Rabies, *et al.*—Last minute report upon the most recent research in immunity to the viral diseases. Should not be missed.

GOODPASTURE, E. W. Immunity to Virus Diseases. New Eng. J. Med. 222, 22:901 (May 30), 1940.

Our Trachomatous Population—Where do you think trachoma is most prevalent? Probably you will be surprised by the spot map of reported cases accompanying this discussion of the disease among Indian and non-Indian people in the U. S. A.

GRADLE, H. S. Incidence and Distribution of Trachoma in the United States. Sight-Saving Rev. 10, 1:13 (Mar.), 1940.

Prophylaxis of Foot Defects—Preventing adult foot disorders is best done by correcting the posture habits of the child. This paper ably discusses the child's foot and the shoeing and care thereof.

HAUSER, E. D. M. Care of Feet in Children. Pub. Health Nurs. 32, 5:285 (May), 1940.

Promptness of Isolation—It is assumed that the prompt isolation of communicable disease cases helps in control of epidemics. This implies a minimum of delay in calling the physician after the first signs appear, in transmitting the report to the health department and in the public health nurse's first visit. What actually hap-

pens in one well regulated community is revealing.

LANE, E. A. Administrative Factors Involving Effectiveness of Communicable Disease Control. Pub. Health Rep. 55, 17:711 (Apr. 26), 1940.

Experiments upon Cold-Virus Vaccine—Evidence obtained from a small group of adults indicates that a tissue-culture cold-virus vaccine is effective in preventing natural colds. Given hypodermically the virus is safe but intranasal use seems to cause colds.

POWELL, H. M., *et al.* Further Inoculation-Experiments with the Common-Cold Virus. J. Immunol. 38, 4:309 (Apr.), 1940.

Protecting Children from Whooping Cough—Favorable results from immunization with pertussis vaccine are reported from San Francisco. Of 64 immunized children who were exposed, 5 contracted the disease, whereas all but one of the exposed controls came down with whooping cough. How long the immunity lasts is not established.

SINGER-BROOKS, D. Pertussis Prophylaxis. J.A.M.A. 114, 18:1734 (May 4), 1940.

BOOKS RECEIVED

THE FIRST FIVE YEARS OF LIFE: A Guide to the Study of the Preschool Child. By Arnold Gesell, et al. New York: Harper, 1940. 393 pp. Price, $3.50.

WE, THE PARENTS: Our Relationship to Our Children and to the World Today. By Sidonie Matsner Gruenberg. New York: Harper, 1939. 296 pp. Price, $2.50.

PARENTS AND CHILDREN GO TO SCHOOL. By Dorothy Walter Baruch. Chicago: Scott, Foresman and Co., 1939. 504 pp. Price, $3.00.

BIOLOGICAL SYMPOSIA, Vol. I. Jaques Cattell, Editor. Lancaster: Jaques Cattell Press, 1940. 238 pp. Price, $2.50.

HOW TO WORK WITH PEOPLE. By Sumner Harwood. Cambridge: Cambridge Analytical Services, 1940. 197 pp. Price, $2.50.

A MANUAL OF THE COMMON CONTAGIOUS DISEASES. By Philip Moen Stimson. 3d ed., rev. Philadelphia: Lea & Febiger, 1940. 465 pp. Price, $4.00.

VITAL STATISTICS OF THE UNITED STATES, 1937. Part I. Natality and Mortality Data for the United States Tabulated by Place of Occurrence with Supplemental Tables for Hawaii, Puerto Rico, and the Virgin Islands. 616 pp. Price, $2.00. Part II. Natality and Mortality Data for the United States Tabulated by Place of Residence. 186 pp. Price, $1.25. Prepared under the supervision of Dr. Halbert L. Dunn. Washington: Government Printing Office, 1939.

AN ANATOMICAL ANALYSIS OF SPORTS. By Gertrude Hawley. New York: Barnes, 1940. 191 pp. Price, $3.00.

CHEMISTRY AND MEDICINE. Edited by Maurice B. Visscher. Minneapolis: University of Minnesota Press, 1940. 296 pp. Price, $4.50.

YOUR MARRIAGE: A Guide to Happiness. By Norman E. Himes. New York: Farrar & Rinehart, 1940. 434 pp. Price, $3.75.

FEEDING THE FAMILY. By Mary Swartz Rose. 4th ed. New York: Macmillan, 1940. 421 pp. Price, $3.75.

THE MARCH OF MEDICINE. Edited by the Committee on Lectures to the Laity of the New York Academy of Medicine. New York: Columbia University Press, 1940. 168 pp. Price, $2.00.

AS I REMEMBER HIM. The Biography of R. S. By Hans Zinsser. Boston: Little, Brown, 1940. 443 pp. Price, $2.75.

INTRODUCTION TO COMMUNITY RECREATION. By George D. Butler, Editor. New York: McGraw-Hill, 1940. 547 pp.

OAKES' POCKET MEDICAL DICTIONARY. Compiled by Lois Oakes. 4th ed. Philadelphia: Reilly, 1940. 409 pp. Price, $1.00.

PSYCHOLOGY. By John H. Ewen. Philadelphia: Reilly, 1939. 72 pp. Price, $.50.

INDUSTRIAL HEALTH IN WAR. By Industrial Health Research Board. New York: British Library of Information, 1940. Price, $.25.

HEADLINING AMERICA: 100 of the Best News and Feature Stories of 1938–1939. Edited by Frank Luther Mott and a Board of Coöperating Editors. New York: The Dryden Press, 1940. 244 pp. Price, $1.50.

AN INTRODUCTION TO THE MICROBIOLOGY OF WATER AND SEWAGE FOR ENGINEERING STUDENTS. By P. L. Gainey. Minneapolis: Burgess Publishing Co., 1939. 283 pp. Price, $3.00.

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COMPLETE GUIDE FOR THE DEAFENED. By A. F. Niemoeller. New York: Harvest House, 1940. 256 pp. Price, $3.00.

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ASSOCIATION NEWS

SIXTY-NINTH ANNUAL MEETING
DETROIT, MICH., OCTOBER 8–11, 1940

HEADQUARTERS
Book-Cadillac Hotel and Hotel Statler

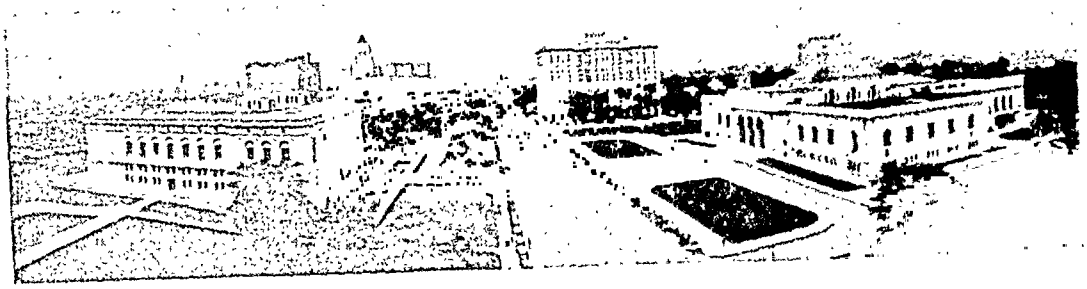
RAILROAD FARES FROM VARIOUS POINTS TO DETROIT, MICH.

AMERICAN PUBLIC HEALTH ASSOCIATION

OCTOBER 8–11, 1940

From	*One-way Pullman Travel*	*Round trip Pullman Travel*	*One-way Lower*	*One-way Upper*
Atlanta, Ga.	$22.24	$36.40	$5.80	$4.40
Baltimore, Md.	18.00	33.70	4.50	3.10
Boston, Mass.	23.30	42.75	5.25	3.60
Buffalo, N. Y.	8.40	15.10	2.10	1.45
Chicago, Ill.	8.55	16.65	2.65	1.80
Cleveland, Ohio	4.90	9.65	2.65	1.80
Dallas, Tex.	34.92	56.35	8.95	6.80
Denver, Colo.	39.61	63.25	9.45	7.20
Duluth, Minn.	21.85	37.20	5.25	4.00
Fort Worth, Tex.	34.92	56.35	8.95	6.80
Indianapolis, Ind.	8.05	15.70	2.65	1.80
Jacksonville, Fla.	32.42	51.80	8.40	6.40
Kansas City, Mo.	22.33	37.35	5.25	4.00
Louisville, Ky.	11.20	20.80	3.15	2.20
Los Angeles, Calif.	74.71	106.95	18.90	14.40
Memphis, Tenn.	22.40	37.30	5.80	4.40
Milwaukee, Wis.	11.10	20.50	3.20 *	2.35 *
Minneapolis, Minn.	20.39	35.00	4.50	3.40
Nashville, Tenn.	17.01	28.60	5.30	3.80
New Orleans, La.	32.90	52.85	8.40	6.40
New York, N. Y.	21.50	39.75	4.50	3.10
Omaha, Nebr.	23.11	39.10	5.80	4.40
Philadelphia, Pa.	19.40	36.25	4.50	3.10
Pittsburgh, Pa.	8.85	17.25	2.65	1.80
Portland, Ore.	72.89	106.95	18.40	14.00
Salt Lake City, Utah	53.34	76.45	13.40	10.20
San Francisco, Calif.	74.71	106.95	18.90	14.40
Seattle, Wash.	72.89	106.95	18.40	14.00
St. Louis, Mo.	14.90	26.30	3.15	2.20
Washington, D. C.	18.00	33.70	4.50	3.10
Montreal, Que.	19.25	34.65	4.20	2.90
Halifax, N. S.	40.60	69.25	8.95	6.70
Ottawa, Ont.	16.25	29.25	4.10	3.05
Quebec, P. Q.	24.90	44.80	6.20	4.50
Toronto, Ont.	7.75	13.95	2.10	1.45
Vancouver, B. C.	72.89	106.95	19.20	14.60

* Seat to Chicago



Detroit Art Center

DETROIT HOTELS

Hotel	Room Capacity	Single Room: Without Bath	Single Room: With Bath	Double Room: Without Bath	Double Room: With Bath
Abington	336		$3.00 up		$4.00–$5.00
Barlum	800		2.00 "		3.00– 4.00
Belcrest	400		3.00 "		4.00– 5.00
Book-Cadillac	1,200		3.00 "		5.00– 6.00
Briggs	200		2.00 "		3.00– 4.00
Detroit Leland	800		2.50 "		4.00– 5.00
Fairbairn	400	$1.25	2.50 "	$2.50	3.00– 3.50
Fort Shelby	900		2.50 "		4.00– 5.00
Imperial	200		2.00 "		2.50– 3.50
Lee Plaza	475		3.00 "		5.00– 6.00
Norton	250	1.25	2.00 "	$2.50–$2.75	3.00– 4.00
Palmetto	324		2.50 "		4.00– 5.00
Prince Edward, Windsor	250		2.50 "		4.00– 5.00
Savarine	500	1.50	2.25 "	$2.50	3.25– 5.00
Statler	1,000		3.00 "		5.00– 5.50
Tuller	800		2.00 "		3.50– 4.50
Wardell	650		3.00 "		4.50– 5.50
Webster Hall	800	1.50	2.00 "	2.50	3.50– 4.00
Whittier	850		3.00 "		4.50– 5.00
Wolverine	500		1.50 "		2.50– 4.00

.....(Cut off on this line and mail to the hotel of your choice).....

HOTEL RESERVATION BLANK FOR THE DETROIT MEETING AMERICAN PUBLIC HEALTH ASSOCIATION, OCTOBER 8–11, 1940

To
(Name of Hotel)

Please reserve for me rooms for persons for the A.P.H.A. Meeting.

Single room Double room

Maximum rate per day for room $..... Minimum rate per day for room $.....

I expect to arrive If date of arrival is changed I will notify you at least 24 hours in advance.

Please acknowledge this reservation.

Name

Street address

City State

APPLICANTS FOR MEMBERSHIP

The following individuals have applied for membership in the Association. They have requested affiliation with the sections indicated.

Health Officers Section

James R. Amos, M.D., Dist. Health Office, Higginsville, Mo., Dist. Health Officer

Martin Bernfield, M.D., Tombstone, Ariz., City Health Officer

John F. Busch, M.D., N. E. Peachtree St., Atlanta, Ga., Clinician, Div. of Tuberculosis Control, State Dept. of Public Health

George F. Campana, M.D., M.P.H., 114 Terrace Place, Brooklyn, N. Y., Medical Officer in Charge, Williamsburg-Greenpoint Health Dist.

Abe J. Davis, M.D., Swainsboro, Ga., Regional Medical Director, State Health Dept.

Lt. Col. Charles F. Davis, M.C., U. S. Army, Holabird Quartermaster Depot, Baltimore, Md., Post Surgeon

Herbert Duncan, M.D., Lewisburg, W. Va., Director, Greenbrier Health Dist.

H. Manning Elliott, M.D., 116 W. Temple St., Los Angeles, Calif., Director, Venereal Disease Clinic

J. Rufus Evans, M.D., 120 Clairmont Ave., Decatur, Ga., Commissioner of Health, Dekalb County Board of Health

Robert B. Griffin, M.D., 504 Church St., Marietta, Ga., Medical Director, Northwest Region, State Dept. of Health

James F. Hackney, M.D., M.P.H., 804 City Hall, Atlanta, Ga., Asst. Health Officer

W. B. Harrison, M.D., Gainesville, Ga., Health Commissioner, Hall County Health Dept.

Frank D. Laffoon, 312 Broadway, Jefferson City, Mo., State Supervisor, Public Health Projects, W.P.A.

Sigma V. Lewis, M.D., E. Main St., Plymouth, N. C., Dist. Health Officer, Currituck-Dare-Hyde-Tyrrell-Washington Dist. Health Dept.

Wilbur D. Lundquist, M.D., Burke County Health Dept., Waynesboro, Ga., Commissioner of Health

Burruss B. McGuire, M.D., Health Dept., Kenansville, N. C., Health Officer, Duplin County

Frank Onufrock, 332 S. Eyon St., Colorado Springs, Colo., Member, Colorado State Board of Health

Charles A. O'Quinn, M.D., County Health Dept., Perry, Fla., Director

Earle M. Rice, M.D., D.T.M., 137 Stocker Drive, Windemiere, Charleston, S. C., Director, Health & Sanitation Div., State Public Service Authority

Carolyn Silbermann, M.D., 428 E. 140th St., New York, N. Y., Health Officer-in-Training, East Harlem Health Dist.

James H. White, M.D., Lowndes County Health Dept., Corinth, Miss., Health Officer

Laboratory Section

Laura F. Bates, A.B., 805 Grant St., Madison, Wis., State Laboratory of Hygiene

Phillip J. Brady, P. O. Box 343, Pullman, Wash., Student, Dept. of Bacteriology, Washington State College

Doris F. Olson, B.S., 1304 York St., Denver, Colo., Laboratory Technician, Presbyterian Hospital

Lester V. Smith, B.A., Chattanooga Branch Lab., Chattanooga, Tenn., Director

Robert D. Speer, 802 City Hall, Atlanta, Ga., Chemist-Bacteriologist, City Health Dept.

Vital Statistics Section

Frances R. Griffith, B.S., 2678 Jasmine St., Denver, Colo., Supervisor, Statistical Tabulating Unit, State Div. of Public Health

Eugene L. Hamilton, 103 City Hall Annex, Dallas, Tex., Registrar of Vital Statistics, Public Health Dept.

Engineering Section

Joel C. Beall, B.S. in C.E., 6 Hardeman Bldg., Macon, Ga., Assistant Engineer, State Dept. of Public Health

Harry C. Essick, 814 N. Monroe St., Albany, Ga., Sanitary Inspector, U. S Public Health Service

George H. Heryford, County Health Dept., Medford, Ore., Sanitarian, Jackson County Health Dept.

Loyal W. Murphy, Jr., B.S., 6 Hardeman Bldg., Macon, Ga., Assistant Engineer, State Dept. of Public Health

Earl A. Neuru, B.S., Health Dept., Thurston County Court House, Olympia, Wash., Acting Sanitarian

Industrial Hygiene Section

Kenneth J. Wulfert, B.S. in E.E., Box 116, Clayton, Mo., Asst. Public Health Engineer and Industrial Hygiene Engineer, St. Louis County Health Dept.

Food and Nutrition Section

Ernest R. Barron, A.B., 1 Carlisle St., Rox-

bury, Mass., Graduate Student, Massachusetts Institute of Technology

Martha J. Singleton, A.B., 4800 Jefferson St., Kansas City, Mo., District Supervisor of Housekeeping Aid, W.P.A.

Maternal and Child Health Section

Isabella Haskell, M.D., 2401 Davidson Ave., Bronx, N. Y., Medical Inspector, Dept. of Health

Arthur E. Karlstrom, M.D., 1600 W. Lake St., Minneapolis, Minn., Director of Hygiene and Health Education, Minneapolis Public Schools

Georgia V. Mills, M.D., 854 Algonquin Ave., Detroit, Mich., Field Physician in Maternal and Child Hygiene, State Dept. of Health

John W. Ross, D.D.S., 1520 Spruce St., Philadelphia, Pa., Private Practitioner

James E. Russell, Jr., M.D., 820 Metropolitan Bldg., Denver, Colo., School Physician

Public Health Education Section

Earnest Ballow, 1321 Freeman St., Santa Ana, Calif., Sanitarian, Orange County Health Dept.

Louisa J. Eskridge, A.B., C.P.H., 12 Seneca St., Geneva, N. Y., Executive Secretary, Ontario County Committee on Tuberculosis and Public Health

Samuel Hoberman, M.D., 115 Salem St., Malden, Mass., President, Malden Tuberculosis and Health Assn.

Edmund E. Jeffers, B.A., 514 East Ann St., Ann Arbor, Mich., Student, Univ. of Michigan

Rae E. Kaufer, B.S. in Ed., 56 Central Ave., Lynn, Mass., Executive Secretary, Lynn Tuberculosis League

Jorma L. Kaukonen, B.A., U. S. Public Health Service, Washington, D. C., Asst. Health Education Specialist

Kathryn I. Maxwell, R.N., 15726 Rutherford Ave., Detroit, Mich., Public Health Nurse and Field Supervisor, Dept. of Health

William J. McMenamy, D.D.S., 2652 Fairfax St., Denver, Colo., Supervisor, Dental Dept., Denver Public Schools

Verne L. G. Wilt, D.D.S., 806 Chamber of Commerce Bldg., Los Angeles, Calif., Chief Dentist, Health Service Section, Los Angeles City School District

Public Health Nursing Section

Alice F. Brackett, R.N., M.A., 911 Humboldt Bank Bldg., San Francisco, Calif., Public Health Nursing Consultant, U. S. Children's Bureau

Lucille M. Brown, R.N., Anchorage Health Dept., Anchorage, Alaska, Staff Nurse

Winifred R. Clarke, R.N., M.A., 71 Parkview Place, Baldwin, N. Y., Instructor in Health Education, Hofstra College

Vera A. Mingledorff, B.S., P. O. Box 335, Griffin, Ga., Consultant Nurse, West Central Region, State Dept. of Public Health

A. Margrete Smock, R.N., Belle Glade, Fla., Camp Nurse, Farm Security Admin., U. S. Dept. of Agriculture

Alma T. Spencer, R.N., Territorial Dept. of Health, Kodiak, Alaska, Public Health Nurse

Ida J. Sprenger, Territorial Dept. of Health, Nome, Alaska, Public Health Nurse

M. Idella Sundquist, R.N., 843 S. University Blvd., Denver, Colo., School Nurse, Denver Public Schools

Mary K. West, 1515 80th Ave., Oakland, Calif., Public Health Nurse, Alameda County Health Dept.

Dorothy K. Whitney, R.N., B.S. in N., Territorial Dept. of Health, Palmer, Alaska, Public Health Nurse

Martha E. Wright, Trenton, Ga., County Health Nurse

Epidemiology Section

Oma H. Price, M.D., 2332 7th Ave., New York, N. Y., Medical Consultant, Bureau of Social Hygiene, City Health Dept.

Frederick Sargent, 96 Sutherland Road, Brookline, Mass., Student, Massachusetts Institute of Technology

John M. Walton, M.D., City Hall, Atlanta, Ga., Venereal Disease Control Officer, City Health Dept.

Unaffiliated

Donald M. Alderson, M.D., 521 Church St., Ann Arbor, Mich., Student, Univ. of Michigan

Tarsicio Anzola, M.D., 520 Jefferson St., Apt. 6, Ann Arbor, Mich., Student, Univ. of Michigan

William E. Brown, M.D., College of Medicine, Eden & Bethesda Aves., Cincinnati, Ohio, Associate Professor of Preventive Medicine, Univ. of Cincinnati

William A. Horan, M.D., 319 Broad St., Providence, R. I., Chief, Crippled Children's Bureau, State Dept. of Public Health

Bernard McDevitt, Jr., A.B., 111 W. Washington St., Chicago, Ill., Instructor of Public Health Law, Loyola Univ.

Levitte Mendel, A.B., 138 Byron St., Palo Alto, Calif., Student, Univ. of Michigan

John A. O'Connell, M.D.V., 31 Milk St., Rm. 616, Boston, Mass., City Veterinarian

Carl B. Pitman, D.D.S., 914 Doctors Bldg., Atlanta, Ga., Director of Dental Health, Fulton County School System

Takemune Soda, M.D., M.P.H., Taihoku Imperial Univ., Taihoku, Japan, Professor, Institute for Tropical Medicine and Medical Officer, Formosa

Buell H. Van Leuven, M.D., 213 Clinton St., Petoskey, Mich., Public Health Trainee, Univ. of Michigan

Assad Jarrah Zade, M.D., 772 Sherbrooke St., W., Montreal, Que., Canada

DECEASED MEMBERS

Lewis V. Carpenter, University Heights, N. Y., Elected Member 1932, Elected Fellow 1937

Clifford P. Fitch, D.V.M., St. Paul, Minn., Elected Member 1915

Frederick G. Metzger, M.D., Carthage, N. Y., Elected Member 1919

Samuel J. Stewart, M.D., Alhambra, Calif., Elected Member 1925, Elected Fellow 1932

DR. BENJAMIN G. HORNING TO JOIN STAFF OF A.P.H.A.

BENJAMIN G. HORNING, M.D., M.P.H., who for the last four years has been Health Officer of the City of Hartford, Conn., has resigned, as of July 15, to join the staff of the American Public Health Association as Associate Field Director, under the Committee on Administrative Practice. Dr. Horning's responsibility will primarily be in connection with the City and Rural Health Conservation Contests for 1940.

Dr. Horning, who is a graduate of the Harvard Medical School, class of 1928, and of the Johns Hopkins School of Hygiene and Public Health, was formerly connected with the Connecticut State Department of Health as epidemiologist and in charge of local health administration.

CLOSING DATE FOR SUBMITTING FELLOWSHIP APPLICATIONS

MEMBERS who may be interested in applying for Fellowship in the A.P.H.A. are hereby advised that Fellowship applications should be received not later than August 1, to insure consideration at the 69th Annual Meeting.

EMPLOYMENT SERVICE

The Association Employment Service seeks to bring to the attention of appointing officers the names of qualified public health personnel and to act as a clearinghouse on employment. This is a service of the Association conducted without expense to employer or employee.

From the registry of persons available, selected announcements are published from time to time. Appointing officers may obtain lists of all registrants on request.

The Association welcomes inquiries with regard to persons qualified, especially in the following classifications:

Administrative health officers
Epidemiologists
Public health educators
Maternal and child health physicians
Industrial hygienists
Laboratory directors

Positions Wanted

ADMINISTRATIVE

Physician, with Dr.P.H. degree, who has had 6 years' experience as public health administrator, seeks administrative position in full-time city or city-county health department. A367

Physician, M.P.H., Harvard; well experienced in city and rural health administration, will consider appointment as district health officer or in city or state health department. A418

A position in epidemiology or administrative public health is desired by physician with C.P.H. from Johns Hopkins, 11 years' administrative public health experience and excellent background of communicable disease control and school health service. A368

Position in administrative public health, maternity, infancy and child health, or health education desired by physician with C.P.H. from Johns Hopkins, who has had experience in these fields. A343

Well qualified physician, with M.P.H. from Johns Hopkins, and experienced as county health officer and now assistant health officer in a large city, will consider county or city administrative position. A383

Physician, M.D., Yale; M.S.P.H., Columbia; also short course for Health Officers, Vanderbilt; good clinical background; 3 years' public health experience; will consider appointment in child health, epidemiology, or public health administration. A350

Experienced physician who has been local health officer and school physician in New York State, several months' experience as acting city health officer, with M.P.H. from Harvard School of Public Health, wishes position in administration, epidemiology, or public medical service. A423

Physician, M.P.H., Johns Hopkins, experienced in district health administration, will consider position as county health officer or in state or city health department. A458

HEALTH EDUCATION

Position as health coördinator desired by young woman, experienced teacher in health education, with M.S. from the University of Michigan. H398

Experienced teacher in public health and author; M.A., Columbia; experienced in teaching public health nursing and carrying field promotion, wishes broad opportunity to train field personnel in extending knowledge and interest to the general public, especially through group education, institutes, exhibits, and rural programs. H400

Young woman, Ph.D., Columbia University, splendid background of experience in health education, will consider position as director of public health education. H294

LABORATORY

Experienced bacteriologist, young man of 33, Sc.B., who for several years has been in charge of state laboratory doing public health and diagnostic bacteriology, immunology, and serology, will consider opening. L427

Physician, C.P.H., Harvard-Technology; experienced as bacteriologist and pathologist and director of state laboratories, desires position. L208

SANITARY ENGINEERING

Public health engineer, B.S. in Civil and Sanitary Engineering; C.P.H., University of North Carolina; 3 years' experience with state department of health as field

supervisor during which time he was in charge of shellfish sanitation; also experienced as district sanitarian; seeks position in public health engineering field. E430

Engineer with good training and experience in water treatment, sewage plant operation and in research, wishes position as superintendent. Can go anywhere. E422

ADVERTISEMENT

Opportunities Available

DIRECTOR OF HEALTH EDUCATION—Public health nurse with college degree; must be experienced in educational work; $1,620, plus car allowance, increasing annually until maximum of $2,100 is reached; 41 hour week; duties will deal exclusively with tuberculosis program. PH-70, Medical Bureau, Palmolive Building, Chicago.

INSTRUCTOR IN PUBLIC HEALTH NURSING—For outpatient department large hospital having university affiliation; will carry courtesy appointment as instructor on university faculty also; B.S. degree and public health certificate required; $2,000, maintenance. PH–71, Medical Bureau, Palmolive Building, Chicago.

OUTPATIENT DEPARTMENT DIRECTOR — Graduate nurse with college degree and postgraduate training public health; department averages 200 patients daily; minimum 2 years' outpatient department experience in some position of responsibility; 44 hour week; $175, partial maintenance; California. PH–72, Medical Bureau, Palmolive Building, Chicago.

PUBLIC HEALTH SUPERVISOR—Long-established municipal public health nursing association; heavy bedside nursing program; city of 50,000. PH–73, Medical Bureau, Palmolive Building, Chicago.

PUBLIC HEALTH NURSES—Two; for county health department; must have public health certificates; $1,800 plus $600 travel allowance; southwest. PH–74, Medical Bureau, Palmolive Building, Chicago.

VISITING NURSE—Duties will combine calls for large insurance company with care of children in day nursery; recent graduate from approved public health course eligible; private office, car and its maintenance furnished; $125; midwest. PH-75, Medical Bureau, Palmolive Building, Chicago.

SCHOOL NURSE—Fairly large town, northern Wisconsin; duties begin August 15. PH–76, Medical Bureau, Palmolive Building, Chicago.

SCHOOL NURSE—Public health training must be supplemented by excellent academic background; $135; Michigan. PH–77, Medical Bureau, Palmolive Building, Chicago.

PUBLIC HEALTH PHYSICIAN—To assist director of municipal syphilis control program; eastern metropolis. PH–78, Medical Bureau, Palmolive Building, Chicago.

SCHOOL PHYSICIAN—Permanent appointment in vicinity nation's capital; $3,600, increasing; man around 35 preferred. PH–79, Medical Bureau, Palmolive Building, Chicago.

COUNTY HEALTH OFFICERS—Young men desiring public health training; experience not required. PH–710, Medical Bureau, Palmolive Building, Chicago.

STUDENT HEALTH PHYSICIAN — Resident appointment in exclusive school for young women; should be well qualified in internal medicine; preference for man or woman with Ph.D. in addition to M.D.; midsouth. PH–711, Medical Bureau, Palmolive Building, Chicago.

SCHOOL PHYSICIAN—School for boys; New England. PH–712, Medical Bureau, Palmolive Building, Chicago.

Situations Wanted

BACTERIOLOGIST—B.S., M.A., Ph.D., large university; splendid experience in teaching and research; 8 years, serologist, large hospital, metropolitan area; for further information please write Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago.

PUBLIC HEALTH PHYSICIAN—Received public health training, University of Michigan; active in public health work since 1935; especially interested child hygiene; under 40; Protestant; for further information please write Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago.

PUBLIC HEALTH NURSE—Has just received B.S. in nursing education, following completion 5 year university course; public health training included 90 hours' field work; owns car; immediately available; for further information please write Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago.

NEWS FROM THE FIELD

FOUNDATION FOR THE STUDY OF NEOPLASTIC DISEASES

ESTABLISHMENT of a foundation for the study of the treatment of cancer will make the University of Pennsylvania an important center for the collection and utilization of vitally needed information in this field. It will be known as the Foundation for the Study of Neoplastic Diseases, and will be supported by The Penn Mutual Life Insurance Company for a period of 5 years.

The Foundation will be under the immediate direction of Dr. John S. Lockwood, who will have the coöperation of all chiefs of service in the University Hospital.

OKLAHOMA HEALTH DEPARTMENT TO OPEN LIBRARY

THE State Health Department of Oklahoma will open a library in its offices in Oklahoma City with material available to public health workers and private physicians.

Information will be furnished to physicians on request on prevalence and trends in diseases, and books on public health will be made available to health workers in units throughout the state.

PERIODICAL SERVICE FOR RURAL PHYSICIANS IN CALIFORNIA

THE regents of the University of California have authorized an increase in the budget of the university's Medical Center Library in San Francisco, to maintain a circulating periodical service for rural physicians throughout the state.

The costs of this service will be for mailing only.

DO LANDFILLS ENDANGER THE PUBLIC HEALTH OR SAFETY?

WITH slight but important reservations, the answer is " no " according to a preliminary report of the board of experts appointed to investigate five landfills maintained in the Borough of Queens, New York.

In the opinion of this group, " there are no conditions presently obtaining at the five landfills which endanger the public health or safety." The board is " convinced that certain potential health hazards obtaining previously at the sites of these fills have been diminished." With respect to the future, it concludes that " there are no conditions presently obtaining at the five landfills which may endanger the public health or safety in the future so long as sound sanitary practice is continued."

The procedure used in the operation of New York City landfills and the events leading up to the controversies over the practice is discussed in *Health News* (New York State), July 24, 1939. Adoption by the city of the landfill as the most economical method of disposing of garbage and refuse gave rise to strenuous objections from persons who resided in the vicinity of the landfill operations.

Residents charged that such landfills created offensive nuisances and endangered their health and safety. The city Department of Sanitation contended that the methods it used assured against the creation of nuisances or conditions prejudicial to health and safety and that the landfill method made possible the reclamation of waste lands and the creation of valuable property for parks and other purposes. For several months the battle between resident groups in

Queens and the city of New York over the " landfill " issue continued, resulting finally in the indictment of William F. Carey, commissioner of the Department of Sanitation, and Dr. John L. Rice, commissioner of health.

When the case came to trial before Justice Wasservogel of the Bronx Supreme Court, counsel for the plaintiff and defendants agreed on a stipulation that the question as to whether such landfills constituted a danger to the public health or safety be decided by a board of experts to be designated by Dr. Thomas Parran, Surgeon General of the United States Public Health Service. Such a board was appointed subsequently and has carried on studies and investigations over a period of several months.

It is composed of Drs. M. J. Rosenau, E. L. Bishop, Huntington Williams, Kenneth F. Maxcy and Mr. R. E. Tarbett, all outstanding experts in the field of public health.

Although in its preliminary report the board concurred unanimously in the above mentioned conclusions, it saw fit to include 16 specific recommendations in regard to procedures which should be followed in the operation of landfills, 4 of which follows:

1. The disposal of wastes by the landfill method should be planned as an engineering project. Operation and maintenance should be under the direction of a sanitary engineer.

14. Inspection and control of rodents should be maintained until the fills are stabilized.

15. After the active period of filling operation is completed, a maintenance program should be continued until the fill has become stabilized so as to insure prompt repair of cracks, depressions and erosion of the surface and side slopes.

16. Studies of the varied problems involved in landfill operations should be continued and should include researches into the biological, chemical and physical activities, as well as the engineering, economic and administrative aspects of the subject.

Other recommendations were related to such matters as maintaining narrow working faces on such fills, prompt covering of exposed surfaces with earth to make a closed cell of each day's deposit, incorporation of waste building materials and other bulky refuse in the body rather than the surface of the fills, final covering of surface and side slopes with earth to a depth of 24 inches, termination of boundary side slopes in a sand and gravel-filled ditch, spraying to allay dust, restricting the compacted refuse layers to a depth of about 8 feet, use of snow fencing to control blowing of papers, maintenance of water under pressure for fire fighting purposes, measures to prevent mosquito breeding, allay disagreeable odors, and to prevent floatage of waste material in adjacent open waters.

It is presumed that a final report will be submitted by the board at some later date. — *Health News*, Albany, N. Y., 17, 19 (May 6), 1940.

PHILIP P. JACOBS, PH.D.

WITH the death of Philip P. Jacobs, at the age of 61, the National Tuberculosis Association loses a competent and faithful member of its staff, on which he had served since 1908, being, in point of service, the oldest. For a number of years he has been Director of Personnel Training and Publications of that Association.

Beginning in 1904 as a newspaper man in Binghamton, he soon deserted that field and, in 1910, obtained a Ph.D. degree from Columbia University, having majored in Sociology. He joined the staff of the National Tuberculosis Association as Assistant Secretary in 1908 and, since 1916, has conducted institutes in many parts of the country particularly for training workers in tuberculosis prevention.

He was the author of *The Campaign Against Tuberculosis in the United States, The Tuberculosis Workers,* and *The Control of Tuberculosis in the*

United States. He has been a member of the American Public Health Association since 1912 and was a Charter Fellow.

He leaves a place which will be hard to fill.

ARIZONA PUBLIC HEALTH ASSOCIATION ELECTS OFFICERS

AT its recent annual meeting, the Arizona Public Health Association elected the following officers, to serve for the current year:

President—H. D. Ketcherside, M.D., Phoenix
President-elect—R. A. Greene, Ph.D., Tucson
First Vice-President—Dr. McMahon
Second Vice-President—Mrs. Caroline Krell, Douglas

GEORGIA PUBLIC HEALTH ASSOCIATION ELECTS OFFICERS

AT its recent annual meeting, held in Atlanta, May 23–25, the Georgia Public Health Association elected the following officers:

President—Dr. J. R. Evans, Stone Mountain
Vice-President—Mrs. Eudelle Trawick, Sparta
Secretary-Treasurer—D. C. Fowler, Atlanta
Chairman of Commissioners of Health Section—Dr. H. T. Adkins, Americus
Chairman of Nursing Section—Mrs. Lessie Cather, Atlanta
Chairman of Engineering Section—R. S. Howard, Jr., Macon

PENNSYLVANIA PUBLIC HEALTH ASSOCIATION MEETING

AT its meeting in Philadelphia, on May 23, the Pennsylvania Public Health Association made two awards for meritorious achievement in the field of public health. The recipients were: Arthur M. Dewess, Executive Secretary of the Pennsylvania Tuberculosis Society, and Dr. Henry Field Smyth, Sr., Professor of Industrial Hygiene at the University of Pennsylvania. The presentation was made by Dr. John J. Shaw, State Secretary of Health.

The citation to Mr. Dewees was in recognition of his public service through his work in the field of tuberculosis control.

Dr. Smyth's recognition was for distinguished public service through his studies and other contributions to the field of industrial hygiene.

New officers for the society were elected as follows:

Honorary President—John J. Shaw, M.D., Harrisburg
President—Harold H. Keller, Philadelphia
President-elect—Paul A. Keeney, M.D., Harrisburg
Vice-President—Harry B. Meller, Pittsburgh
Secretary-Treasurer—C. E. Houston, Washington

OHIO FEDERATION OF PUBLIC HEALTH OFFICIALS ELECTS OFFICERS

THE following officers were elected by the Ohio Federation of Public Health Officials at its recent annual meeting:

President—E. H. Schoenling, M.D., Cincinnati
President-Elect—P. L. Harris, M.D., Ravenna
Secretary-Treasurer—W. D. Bishop, M.D., Greenville
Representative on A.P.H.A. Governing Council—G. D. Lummis, M.D., Middletown
Alternate Representative—M. C. Hanson, M.D., Toledo

SOUTH CAROLINA PUBLIC HEALTH ASSOCIATION ELECTS OFFICERS

THE following officers were elected by the South Carolina Public Health Association, at its annual meeting in May:

President—G. E. McDaniel, M.D., Columbia
President-elect—A. W. Humphries, M.D., Camden
1st Vice-President — Hilla Sheriff, M.D., Columbia
2nd Vice-President—E. T. Ammons, Spartanburg
Secretary-Treasurer—Mrs. Frank George, R.N., Columbia

PUBLIC HEALTH ENGINEERING COURSES AT THE UNIVERSITY OF ALABAMA

THE University of Alabama will inaugurate an expanded program of training in sanitary and public health

engineering in the fall of 1940 with the establishment of two new undergraduate curricula. Under the College of Engineering, there has been set up, following a recommendation of the State Educational Survey Commission, the William Crawford Gorgas School of Public Health and Sanitation, offering instruction in sanitary engineering and in public health and safety engineering.

The school is named after the late General William Crawford Gorgas, Surgeon General of the U. S. Army, whose pioneering work in sanitation and public health is well known, and whose father, General Josiah Gorgas, served as president of the University of Alabama and as professor of civil engineering.

The courses are under the general supervision of Professor George J. Davis, Jr., Dean of the College of Engineering, and of Assistant Professor Gilbert H. Dunstan and Associate Professor James M. Faircloth.

NEW EDUCATIONAL FILMS FOR FOOD HANDLERS

TWO new educational films illustrating approved dish washing and sanitization methods were announced in June as available to health departments undertaking programs of instruction for food handlers in public eating and drinking places.

Eating Out—a 16 mm. two-reel silent movie—was produced for the Flint, Mich., Department of Public Health under the supervision of H. S. Adams, Division of Food and Sanitation. The National Tuberculosis Association cooperated in the production and sent Dr. Adolph Nichtenhauser to direct the film. Inquiries for further information should be addressed to H. S. Adams at the Department of Public Health in Flint, Mich.

In Your Hands—a sound slide-film—emphasizes approved methods of dishwashing and the use of single-service paper untensils especially during rush hours. With the active collaboration of 11 city and state health officials and educators, the film was produced for *Health Officers News Digest,* Room 924, 30 Rockefeller Plaza, New York, N. Y., to whom requests for information should be addressed.

CANNED MOTHER'S MILK PROCESS IS ANNOUNCED

A NEW scientific process that will make it possible to seal mother's milk in cans and sell it in retail stores like commercial condensed milk was described by a speaker at the National Biennial Nursing Convention, held at Philadelphia, Pa., May 11–18.

The Maternity Center Association, of New York, predicted that the process would save the lives of hundreds of prematurely born infants.

It is stated that milk bureaus in New York, Boston, and other cities are distributing mother's milk in jars or frozen in cake form.

PERSONALS

Central States

DR. PAUL P. BAILEY, of Fort Wayne, Ind., has been appointed Health Officer of Allen County, succeeding DR. NOAH A. ROCKEY.

FLOYD C. BEELMAN, M.D.,† of Wichita, Kans., for 3 years Health Officer of Sedgwick County, has accepted the position of Director of the Division of Tuberculosis Control of the Kansas State Board of Health.

DR. NEAL D. CARTER, of Columbus, Ohio, has been appointed head of the Adult Hygiene Division of the Ohio State Health Department.

DR. CLARE GATES, DR.P.H.,* formerly Director of Health Education, of the North Dakota State Department of Health, Bismarck, N. D., resigned to assume the position of Regional Public Health Consultant for Region VII

* Fellow A.P.H.A.
† Member A.P.H.A.

of the Works Projects Administration, with offices at St. Paul, Minn., as of April 1.

DR. CLAUDE D. GREENE, of Spencer, Ind., was recently named Health Officer of Owen County, succeeding DR. BOAZ YOCUM, of Coal City, who held the position for 10 years.

DR. OSCAR S. HELLER, of Greenfield, Ind., has been appointed Health Officer of Hancock County, succeeding the late DR. JAMES B. ELLINGWOOD, of Fortville. Dr. Heller formerly held the position.

PAUL H. JESERICH, D.D.S., of Ann Arbor, Mich., has been appointed a member of the Michigan State Council of Health, for the term ending June 30, 1945, succeeding CARLETON DEAN, M.D., C.P.H.,* of Charlevoix, who resigned recently to become Deputy State Health Commissioner. Dr. Jeserich is President of the Michigan State Dental Society, and Director of Postgraduate Education at the University of Michigan School of Dentistry.

JAMES M. MATHER, M.D., D.P.H.,† of the Branch County Health Department, Coldwater, Mich., has been appointed Lecturer in Epidemiology and Biometrics, at the School of Hygiene, in the University of Toronto, Toronto, Ont., Can., effective July 1.

DR. WALTER M. MCGAUGHEY, of Greencastle, Ind., has been appointed Health Officer of Putnam County, to fill the unexpired term of DR. WILLIAM M. O'BRIEN, resigned, whose term was to have ended December 31, 1941.

DR. PERRY J. MELNICK, of Chicago, Ill., has been appointed as Pathologist to supervise a diagnostic service, of the recently established Division of Cancer Control of the Illinois State Department of Health, in Chicago.

DR. ARLINGTON J. RAWERS, of Mendon, Ohio, has been appointed Health Officer of Mercer County, to succeed the late DR. FRANK E. AYERS, of Celina.

DR. CHARLES E. STEWART, Director of the Battle Creek Sanitarium, Battle Creek, Mich., has announced he will retire at the end of the year. Until then he will serve as adviser to DR. JOHN E. GORRELL, who was appointed Administrator at the Sanitarium in October, 1939. Dr. Stewart joined the staff in 1895.

ELDRED V. THIEHOFF, M.D.,* Director of District Health Department No. 7, with headquarters at Gladwin, Mich., was appointed Assistant Director of the Bureau of Local Health Services, of the Michigan State Health Department, effective April 1.

Eastern States

J. LEON BLUMENTHAL, M.D., DR.P.H.,* of the New York City Department of Health, has submitted his request for retirement to the Board of Health. He served continuously during the past 35 years in various services of the Department of Health connected with child care, and has held the post of Director of Child Hygiene since 1924.

RAYMOND V. BROKAW, M.D.,* of New York, N. Y., has been appointed Chief of the Division of Cancer Control which has been established in the Illinois State Department of Health, with offices in Chicago.

LEROY U. GARDNER, M.D.,† of Saranac Lake, N. Y., Director of the Saranac Laboratory for the Study of Tuberculosis of the Edward L. Trudeau Foundation, received the annual William S. Knudsen Award for the most outstanding achievement in industrial medicine, for the advances in the knowledge of silicosis resulting from his research during the last 11 years.

DR. ELLIOTT P. JOSLIN, of Boston, Mass., has been named Honorary

* Fellow A.P.H.A.
† Member A.P.H.A.

Chairman of the Division of Medicine and Public Health of the Committee on University Development, Yale University, New Haven, Conn.

DR. HAROLD E. LONGSDORF, of Mount Holly, N. J., recently received a citizenship award for "meritorious service in the field of public health," presented by the Mount Holly Service Club.

JOHN J. SHAW, M.D.,† of Harrisburg, Pa., Secretary of the Pennsylvania State Department of Health, has been awarded the Dr. I. P. Strittmatter gold medal of the Philadelphia County Medical Society, in recognition of his work in organizing and correlating the health agencies of the state. The award is given annually for distinguished service in the interests of humanity redounding to the credit of the medical profession. Dr. Shaw is the only public official to receive the award since its first bestowal upon the late Dr. William W. Keen in 1923.

Southern States

EDWIN CAMERON, M.D., C.M., C.P.H.,† of Washington, D. C., Director of the Monongalia County Health Department and West Virginia Public Health Training Center, has been appointed Executive Secretary of the State Board of Health of Delaware, as of July 1.

T. E. CATO, M.D.,† Health Officer of Charleston, W. Va., has taken over the Dade County Health Department at Miami, Fla.

WALLACE M. CHAPMAN, M.D.,† of Harrodsburg, Ky., has been appointed Health Officer of District Health Department No. 3, including the Counties of Antrim, Charlevoix, Emmet, and Otsego, Mich., succeeding CARLETON DEAN, M.D., C.P.H.,* of Lansing.

JOHN D. FAULKNER, B.S.,† of Raleigh, N. C., was transferred from the position of Assistant Engineer, Division of Sanitary Engineering, North Carolina State Board of Health, to the position of Consultant Engineer, Endemic Typhus Control, Division of Epidemiology, State Board of Health, effective April 1.

DR. LUDVIG HEKTOEN, eminent pathologist, Executive Director of the National Advisory Cancer Council of the U. S. Public Health Service, Washington, D. C., Professor and Chairman Emeritus of the Department of Pathology of the University of Chicago, and Director of the John McCormick Institute for Infectious Diseases, has been awarded the honorary degree of Doctor of Science by the University of Chicago.

DR. WALTER B. JOHNSON,† of Cumberland, Md., has been appointed Health Officer of Caroline County, with headquarters at Denton.

JAMES H. LEVAN, C.E.,† of Brownsville, Tex., has been transferred to the U. S. Quarantine Station, Miami Beach, Fla.

DR. ADOLPH MEYER, of Baltimore, Md., has been elected President of the National Committee for Mental Hygiene. He succeeds DR. ARTHUR H. RUGGLES, of Providence, R. I.

DR. ALFRED C. MOORE was recently appointed full-time Medical Health Officer in the Baltimore, Md., Health Department.

THOMAS PARRAN, M.D.,* Surgeon General of the U. S. Public Health Service, was vested with the Order of Carlos Finlay by the Republic of Cuba, and with the Order of Aesculapius by the Medical Society of Colombia, during the recent sessions of the American Scientific Congress in Washington, D. C. The University of Maryland has conferred upon Dr. Parran the degree of Doctor of Science, St. Bonaventure

* Fellow A.P.H.A.
† Member A.P.H.A.

College the degree of Doctor of Laws, and Tufts College the degree of Doctor of Science, at recent commencements.

LEWIS C. SPENCER, M.D.,† of Harrisburg, has been appointed Director of the Vermilion Parish Health Unit, with headquarters in Abbeville, La., succeeding DR. MURPHY M. SIMS, resigned. The unit was in charge of DR. JAMES A. COLEMAN, of New Orleans, pending the appointment of Dr. Spencer.

DR. STUART P. VANDIVIERE, of Milledgeville, Ga., has resigned as Health Commissioner of Americus-Sumter County, to accept an assignment for duty with the U. S. Army air corps at Maxwell Field, Ala. DR. HENRY T. ADKINS, of Cochran, Ga., has been appointed to succeed him in Americus-Sumter County.

Western States

CECIL R. FARGHER, M.D.,† of Wenatchee, Wash., recently Health Officer of Chelan County, has been appointed Health Officer of Clark County, succeeding JOHN A. KAHL, M.D.,† of Vancouver.

J. C. GEIGER, M.D.,* Director of Public Health of the City and County of San Francisco, Calif., was granted a leave of absence of 8 weeks for a public health mission to the Orient, and sailed June 8.

JACQUES P. GRAY, M.D., M.P.H.,* has resigned from the faculty of the University of California, Berkeley, Calif., to become Health Officer of Hillsdale County, Mich.

DR. WILLIAM A. JOHNSON, formerly of Tacoma, Wash., has been appointed Health Officer in Cowlitz County.

DR. GEORGE R. KINGSTON, of Walla Walla, Wash., recently Health Officer in Walla Walla County, has been appointed Health Officer in Chelan County; DR. HAROLD M. U'REN, of Spokane, succeeded him in Walla Walla.

FREDERICK P. PERKINS, M.D.,† of Phoenix, Ariz., has been appointed Secretary and State Superintendent of Public Health of Arizona, to succeed COIT I. HUGHES, M.D.,† who is retiring.

Canada

THE HONORABLE HENRI GROULX, of Montreal, Que., a pharmacist and a member of the Provincial Legislature, has been appointed Provincial Secretary and Minister of Health for Quebec.

DR. JOHN C. MACKENZIE, General Superintendent of the Montreal General Hospital, has been appointed Officer in Charge of all Hospital Administration to the Canadian forces in England.

DEATHS

DR. W. B. ACKER, Health Officer of Hannibal, Oswego County, N. Y., died recently.

DR. E. E. EDDY, of Redwood, Jefferson County, N. Y., died recently. He was Health Officer of the town of Alexandria 1896–1898, 1903–1908, and 1919–1940, and of the village of Alexandria Bay 1921–1935.

FRED M. HOUGHTALING, M.D.,† of Sandusky, Ohio, Health Commissioner of the combined Sandusky City and Erie County Health District, died April 17.

PHILIP P. JACOBS, PH.D.,* Director of Publications and Extension, of the National Tuberculosis Association, New York, N. Y., died June 12, at the age of 61.

DR. LOUIS WHEELER, Health Officer of Tully, Onondaga County, N. Y., died recently.

* Fellow A.P.H.A.
† Member A.P.H.A.

CONFERENCES AND DATES

American Association of Public Health Dentists. Cleveland, Ohio. September 8–9.

American Dental Association. Cleveland, Ohio. September 9–13.

American Dietetic Association — 23rd Annual Convention. Pennsylvania Hotel, New York, N. Y. October 21–24.

American Hospital Association. Boston, Mass. September 16–20.

American Public Health Association —69th Annual Meeting. Book-Cadillac Hotel, Statler Hotel, Detroit, Mich. October 8–11.

American Society of Civil Engineers. Summer Meeting. Denver, Colo. July 24–26.

American Society of Planning Officials. National Conference on Planning, in coöperation with American Institute of Planners, American Planning and Civic Association, and National Economic and Social Planning Association. San Francisco, Calif. July 8–11.

American Water Works Association.

Michigan Section — University of Michigan Union, Ann Arbor, Mich. September 11–13.

Rocky Mountain Section — Cosmopolitan Hotel, Denver, Colo. September 16–17.

Western Pennsylvania Section — Castleton Hotel, New Castle, Pa. September 18–20.

Southwest Section — Mayo Hotel, Tulsa, Okla. October 14–17.

New Jersey Section — Atlantic City, N. J. October 18–19.

Kentucky-Tennessee Section — Lafayette Hotel, Lexington, Ky. October 21–23.

California Section—Los Angeles Biltmore Hotel, Los Angeles, Calif. October 23–26.

Minnesota Section—St. Paul Hotel, St. Paul, Minn. November 7–8.

Association of American Medical Colleges. Ann Arbor, Mich. October 28–30.

Canadian Public Health Association—29th Annual Meeting. Winnipeg, Man. September 23–28.

Dairy Industries Supply Association. Atlantic City, N. J. October 21–26.

Federation of Sewage Works Associations—First Annual Convention, in conjunction with the 1940 Annual Meeting of the Central States Sewage Works Association. Hotel Sherman, Chicago, Ill. October 3–5.

Florida Public Health Association. Tampa, Fla. December.

Indiana State Medical Association. French Lick Springs Hotel, French Lick, Ind. October 29–31.

Institute on Maternal and Infant Hygiene—for registered nurses. University of California, Berkeley, Calif. July 1–20.

Institute on Science and the Nation's Food. Wellesley College, Wellesley, Mass. October 24–26.

International Association of Milk Sanitarians. Joint Meeting with the New York State Association of Dairy and Milk Inspectors. Hotel Pennsylvania, New York, N. Y. October 17–19.

Interstate Post-Graduate Medical Assembly. Cleveland, Ohio. October 13–19.

Michigan Public Health Association. Detroit, Mich. October 8–11.

National Association of Coroners. Hotel Adelphia, Philadelphia, Pa. August 26–28.

National Chemical Exposition—sponsored by the Chicago Section of the American Chemical Society. Stevens Hotel, Chicago, Ill. December 11–15.

National Recreation Congress—25th. Statler Hotel, Cleveland, Ohio. September 30–October 4.

National Restaurant Association. Chicago, Ill. October 7–11.

National Safety Council. Chicago, Ill. October 7–11.

New England Conference on Tomorrow's Children. Under the auspices of the Harvard University Summer School, and the National Conference on Family Relations. Littauer Centre, Harvard University, Cambridge, Mass. July 24–26.

New Jersey Health and Sanitary Association, Inc. 66th Annual Meeting. Hotel Berkeley-Carteret, Asbury Park, N. J. November 15–16.

Pacific Northwest Medical Association. Spokane, Wash. July 10–13.

Pan-American Congress of Ophthalmology. Hotel Cleveland, Cleveland, Ohio. October 11–12.

School Health Education Conference. Sponsored by the California State Departments of Education and Public Health. University of California, Berkeley, Calif. July 22–25.

Schoolmen's Conference—on "Facing Youth Problems." New Jersey State Teachers College, Montclair, N. J. July 11–12.

Society of American Bacteriologists. St. Louis, Mo. December.

Texas Public Health Association. Fort Worth, Tex. September 30–October 2.

Tri-State Conference of Food and Health Officials. Pittsburgh, Pa. October.

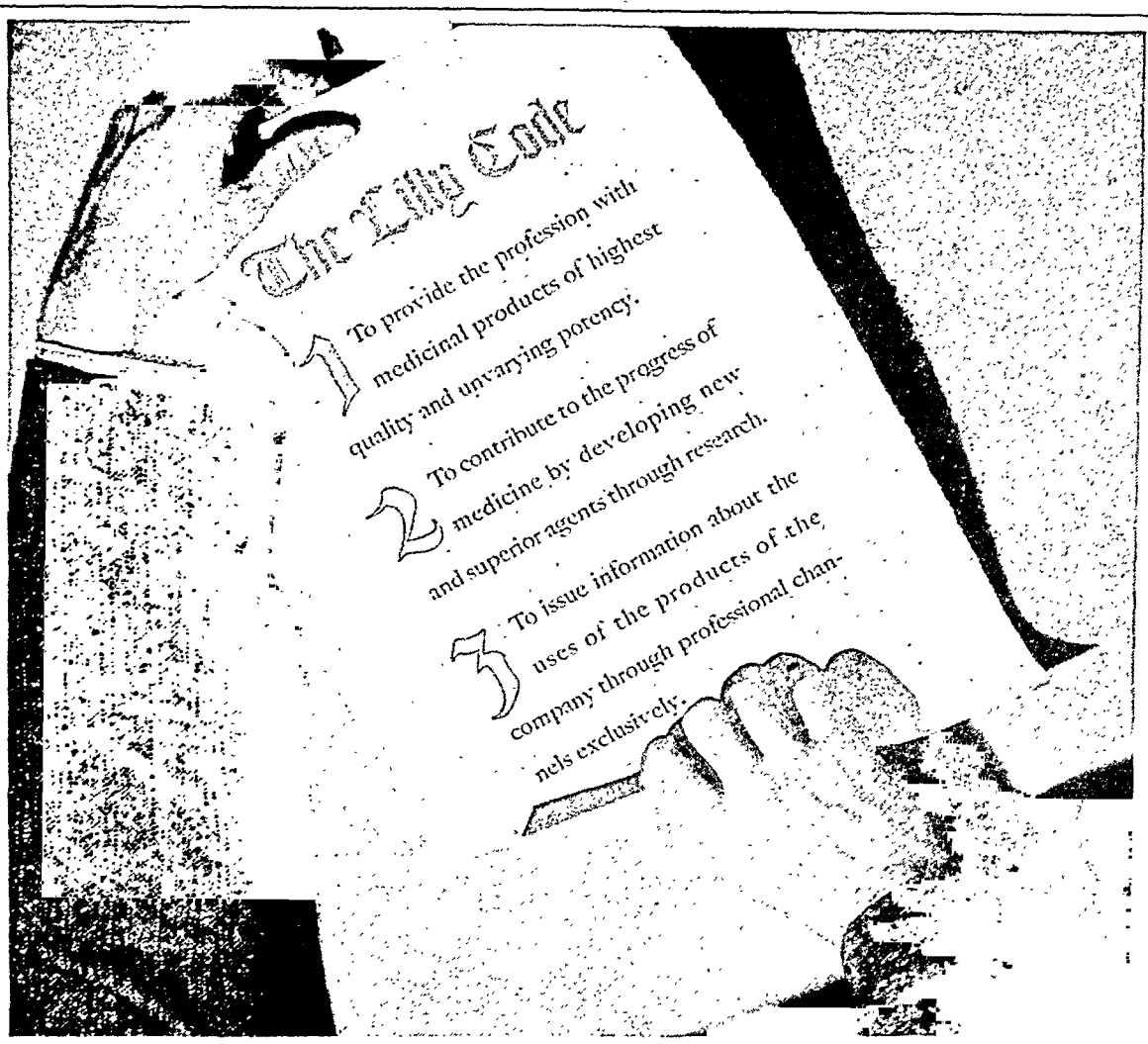
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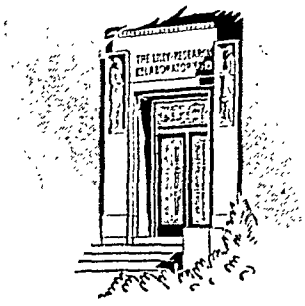
Pan American Congress of Tuberculosis—Fifth. Buenos Aires, and Cordoba, Argentina. October 13–17.

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Industrial Hygiene. A. J. Lanza and Jacob A. Goldberg, Editors	8.50
Manual of Industrial Health Hazards. Joseph B. Ficklen	4.00
Manual of Public Health Nursing. 3d ed. National Organization for Public Health Nursing	2.50
Basic Principles of Healthful Housing. 2d ed. Committee on the Hygiene of Housing — American Public Health Association	.25
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American Journal of Public Health
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Official Monthly Publication of the American Public Health Association

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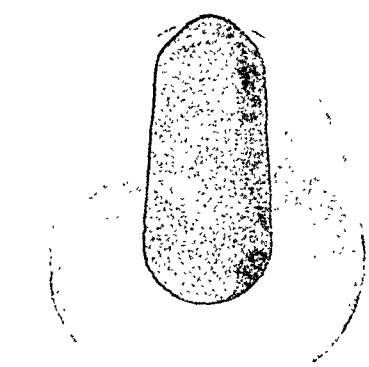
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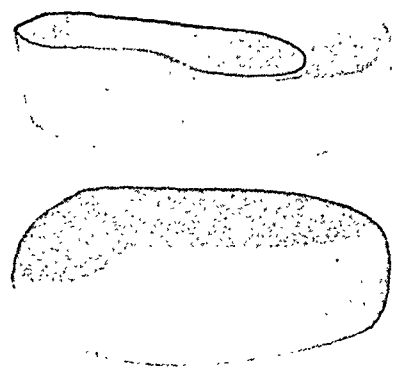
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American Journal of Public Health
and THE NATION'S HEALTH

Volume 30 August, 1940 Number 8

Alabama's Contribution to Public Health*

J. N. BAKER, M.D., F.A.P.H.A.

President, Southern Branch, American Public Health Association; State Health Officer, Montgomery, Ala.

WHEN the doctors of my state gathered in Huntsville early in 1872 for that year's meeting of the Medical Association of the State of Alabama, there was nothing to indicate that they were about to take part in a gathering that was destined to begin a new chapter in the history of public health. There would be the usual addresses of welcome, the usual responses, the usual technical papers, and the usual social affairs, they believed. Then, they expected, they would return to the cities, towns, and rural communities which they had just left and try to put into practice the knowledge gained during that meeting.

However, the Huntsville meeting of 1872 was not "just another medical meeting"; for, a short time after it got under way, Dr. Jerome Cochran, a Mobile physician whose massive head, chin whiskers and quiet determination had made him a marked man at previous meetings, rose quietly to his feet and told his fellow physicians about a dream that had been spawning in his brilliantly creative mind for a year or more—the organization of a State Board of Health altogether divorced from politics and utilizing to the utmost the collective scientific knowledge of Alabama's organized medical profession. He said:

> I would have a general health law passed by the Legislature of this state, carefully prepared so as not to stand in need of frequent revision or amendment. I would have this law to invest the Medical Association of the State with the functions, powers, and responsibilities of a State Board of Health, and these functions I would have exercised through such organs as the association in its wisdom might think best. I would have the same act of the Legislature to invest each county medical society with the functions of a county board of health, said functions to be exercised through such organs as the said county societies should, in their wisdom, determine to be best.

Nearly three years passed before Dr. Cochran's dream was realized, but on February 19, 1875, the Alabama General Assembly passed a law designating the Medical Association of the State of Alabama as the State Board of Health and also designating county medical

* Read before the Southern Branch, American Public Health Association at its Eighth Annual Meeting in Memphis, Tenn., November 21, 1939.

societies affiliated with the State Medical Association as boards of health for their respective counties.

Thus Alabama became the first state in the Union to place its public health machinery beyond the political pale, and to assure the people and its public health workers that the successful and competent performance of duty, and that alone, would determine continuance in service. Naturally enough, what has become known as " the Alabama system " has won the envy and admiration of health departments in other states whose law making bodies were not so fortunate in having at their command such talented professional leadership.

In the early years of the present century, when the American Medical Association was struggling to bring about uniformity of structure in the various state societies, Alabama's scheme of operation was freely consulted and liberally drawn upon. In 1901 the late Dr. C. A. L. Reed, then President of the American Medical Association, referred to this organization as " the incomparable Alabama plan," and Dr. George H. Simmons, the Secretary of the same body, characterized this association as " the best medical organization in the world." Alabama thus remains, as she became, unique and uniquely fortunate in this important respect.

Although Dr. Cochran's brilliant contribution to Alabama's welfare gives me the best right in the world to include him in a discussion of the medical labors of eminent Alabamians, stern truth forces me to confess, reluctantly enough, that he was not a native of that state. He was instead a native of Mississippi. In spite of poor health and the necessity for helping out on the farm, he obtained what passed at that time for a general education, and this he strengthened by well planned reading and private study. Then, after spending about 6 years as a teacher, he entered the Botanic Medical College, in Memphis, and was graduated as a doctor of medicine 2 years later. He then returned to his native Mississippi and there practised his profession for another 2 years. Then he entered the Medical Department of the University of Tennessee and almost immediately was made resident student in the Hospital of the State of Tennessee. Receiving his degree just on the eve of the outbreak of the war between the states, he became a member of the staff of a 3,000 bed Confederate hospital at Okalona, where he treated large numbers of troops wounded at the Battle of Shiloh.

Shortly after Appomattox he moved to Mobile and there, almost penniless, friendless, and in wretched health, he made a brave bid for enough paying patients to enable him to earn a livelihood. In time he became the city's first health officer, but was relieved of his official duties in 1873 because of politics. It was from the experience gained in this service that he realized how vitally necessary it was to the proper functioning of public health agencies that these two forces, politics and official public health—each powerful in its own natural sphere—be completely and irrevocably divorced.

He was asked to reassume his official duties as the protector of Mobile's health when those placed in charge of that work after his dismissal—politically entrenched but helpless against invading germs—failed miserably to protect it against a serious outbreak of yellow fever and smallpox in 1873 and 1874. His subsequent success in stemming the tide of disease and death in the face of his predecessors' failure has been characterized as " a sanitary triumph without a parallel in the world's history." This success and the fame it brought him resulted in his appointment as a member of the

National Yellow Fever Commission. There too he did characteristically outstanding work.

When the Medical Association of the State of Alabama, as one of its first major acts as a State Board of Health, created the position of State Health Officer, it did not have far to look to find a proper person to fill the position. Who but Dr. Cochran could have been seriously considered? Receiving that honor on April 11, 1879, he served loyally and brilliantly until his death on August 17, 1896. Nearly 10 years later the man who was named as his successor characterized him as "the most original thinker and the profoundest philosopher on professional and public health organization that this country or any other has ever produced."

About 3 years after Dr. Cochran began his staggering task of giving Alabama a creditable public health service, a routine Army order transferred a young assistant surgeon and first lieutenant in the Medical Department from Fort Clark, Tex., to Fort Brown, in the same state. That routine order was destined to have a greater effect upon the prosperity and well-being of the human race than many a command sending an army into the field against a powerful foe.

For that young man was Lieutenant William Crawford Gorgas, a native of the city of which Dr. Cochran had been health officer and a son of a distinguished officer of the Confederate Army. And that transfer order carried this young officer to the outskirts of the City of Brownsville, where a yellow fever epidemic was raging, and thus gave him his baptism of fire in the warfare against this disease, a form of warfare with which the name of Gorgas will forever be associated.

Dr. Gorgas's interest in yellow fever, which had manifested itself even before his period of service at Fort Brown, and which was further enhanced after he himself had contracted but recovered from this disease, found further expression during his residence in various other parts of the country. Shortly after the Spanish-American War got under way, he was promoted to the rank of major and made brigade surgeon. He was in Cuba during the entire Santiago campaign and established a yellow fever hospital in Siboney, near Havana. After the war ended, he again found himself on Cuban soil as sanitary officer of the City of Havana.

The whole world knows the story of this Alabamian's masterful success in ridding that beautiful but disease cursed city of yellow fever, a scourge from which it had been free only intermittently for more than 150 years. It knows, also, of the city-wide clean-up campaign which he generaled and which made the yellow fever transmitting Stegomyia mosquito virtually as much a rarity in that, its ideal breeding ground, as in northern Canada or at the top of Pike's Peak. It knows, too, of the virtual conquest of malaria as a result of this same clean-up campaign, adapted in this particular case to the destruction of the malaria transmitting *Anopheles quadrimaculatus*.

With the completion of his task in Havana, Gorgas was transferred to Governors Island as chief surgeon of the Department of the East and remained there until President Theodore Roosevelt called him to another and a vastly more difficult job of health protection on the Isthmus of Panama, the conquest of yellow fever, malaria, and other diseases which had taken heavy toll of French lives and in the end had brought defeat to the attempt of French engineers and workmen to construct an inter-oceanic canal linking the Atlantic and the Pacific. American failure undoubtedly would have followed French failure had he failed in this task. But he did not fail, and the success of that

enterprise is a source of pride and inspiration to all Americans.

There were other tasks awaiting his magic touch, and he turned quickly to their execution. At the invitation of the President of the Republic of Ecuador, he studied health conditions in that country's capital, Guayaquil, which were so bad that it had to be repopulated every 15 years to prevent it from becoming a city without people. His recommendations, prompted by that study, were carried out, and in time Guayaquil began to enjoy a death rate comparable with that of other cities of similar size and situation. Then came a Macedonian call from South Africa, where miners were dying at an alarming rate from pneumonia. That call came in 1913 and was promptly answered. Here again his studies resulted in carefully thought out recommendations, and health conditions improved markedly after they were put into effect. While in South Africa he made a visit to Salisbury, the capital city of Rhodesia, and aided materially with suggestions and recommendations in reducing the prevalence and killing power of malaria and black-water fever. It was while in Salisbury that he learned of his promotion to the position of Surgeon General of the United States Army, with the rank of brigadier general.

It was his country's great good fortune that such a man as he was the official protector of the health of its fighting men during the approximately 19 months of American participation in the World War. As the United States Army expanded with exciting rapidity from a small peace-time force to a huge military machine of approximately 4 million men, he saw to it that the organization and machinery needed to care for their health expanded rapidly enough to measure up to their increased responsibilities. The remarkable degree of health enjoyed by these men—particularly remarkable in view of the devastating influenza epidemic of 1918—is the best possible proof of his success in that difficult rôle.

Upon reaching the Army's retirement age on the eve of the Armistice, he became associated with the Rockefeller Foundation and spent considerable time in Central and South America. On May 8, 1920, he sailed for England and Belgium, planning to make these two countries intermediate stops on another mission of mercy to Africa, this one in the interest of yellow fever control. Before the second stage of his contemplated trip could be undertaken, however, he became ill and died in London on July 4, the 144th birthday of the nation he had served so loyally in war and in peace. Just a short time before the end came, His Majesty King George V visited him at the hospital and personally presented to him the insignia of Knight Commander of the Most Distinguished Order of St. Michael and St. George.

In his *Report and Recommendations to the Transvaal Chamber of Mines,* this eminent Alabamian's own experience dictated the qualifications essential to efficient health administrators. He aptly defined the character qualifications which are necessary to official health administrators:

> The success of any system of sanitation, which is more or less new to any locality, will depend a great deal upon the choice of the man who has charge of carrying it into execution. If he believes in it, has tact, is enthusiastic and persevering, it will succeed. If he is discouraged by difficulties and opposition, he will fail, even if his system is correct.

Gorgas seemed to be summarizing in this recommendation his own admirable qualities of workmanship. Although not a scientist in the accepted term, his achievements honor its implication. His peculiar genius was displayed in an uncanny ability to select the right man

for a specific task; in transmitting his own gifts of determination and pertinacity and recreating in his colleagues and subordinates a sense of loyalty and devotion which are primary requisites for outstanding accomplishments. This axiomatic statement of Gorgas in these recommendations might well constitute a ritual for every health worker regardless of rank or station.

Shortly after Dr. Cochran's death on August 17, 1896, the Board of Censors of the Medical Association of the State of Alabama chose as Alabama's second State Health Officer Dr. William Henry Sanders, also a resident of Mobile.

Born in Tuscaloosa County, Ala., on July 9, 1838, Dr. Sanders became a Bachelor of Arts graduate of the University of Alabama in 1858 and 3 years later received the M.D. degree from the Jefferson Medical College, in Philadelphia. The ink on his diploma had hardly had time to dry when on June 11, 1861, he enlisted for service in the Confederate Army. The following September he was promoted to the rank of assistant surgeon of his regiment and, on March 6, 1863, received a second important promotion, this time to the rank of full surgeon.

After the collapse of the Confederacy, Dr. Sanders spent considerable time in Europe, carrying on studies in the treatment of diseases of the eye, ear, nose, and throat. After his return he began the practice of his specialty in Mobile and also served for a number of years as a professor in the Medical School of the University of Alabama, which was then situated in the port city. He at once became an active and zealous worker in the Medical Association of the State of Alabama, serving as a member of its College of Counsellors, and in 1890 reached the highest unofficial position of honor within the gift of his fellow physicians of the state—the presidency of the State Medical Association. His success in his chosen specialty, his eminence as a college professor, and his prominence in the affairs of his state's organized medical profession made him the all but inevitable choice for the position which had been made vacant by Dr. Cochran's death. He served his profession and the people of Alabama in that capacity for slightly more than a fifth of a century, considerably longer than any other person who ever held the office.

It was during Dr. Sanders's period of service as State Officer—in 1914—that Walker County, Ala., became the first county in the state, and one of the very first in the United States, to establish its own full-time health department. It was the great pleasure and privilege of the present State Health Officer—your speaker—to participate in the closing episode of this stirring drama of county health organization when, about 2 years ago, Alabama's 67th and last county was established on a full-time health basis. At that time Alabama became, and still remains, one of only three states in the entire Union having a full-time local health department in every county, the only one south of the Potomac and Ohio Rivers, and the only one in which there are as many as 24 or more counties.

In 1906—33 years ago, and well before the creation of the first full-time county health unit in this country—Sanders delivered before the American Medical Association a remarkable and prophetic address whose title was "State Medicine: Its Foundation, Superstructure and Scope." In this thesis, which appeared in the July 6, 1907, issue of the *Journal of the American Medical Association,* Sanders appears at his best in expounding the philosophy breathed into the public health organization which Cochran had created, and in his suggestions of its further expansion so as to make it applicable and workable at the federal

level. At the outset, he defines "State Medicine" to mean "the exercise of power by a civil government for the protection of its people against disease, as well as for the promotion of their physical welfare and development"; and, in the development of his theme, makes no effort to stray off into the then unexplored and controversial realms of "socialized medicine." In his great vision he portrayed a national board of health composed of delegates from state boards of health and functioning through a commissioner of health and a number of assistants, each assigned to a specific duty. Courageously facing the fact that, while constitutional limitations restricted direct federal activities in certain fields—specifically the prerogatives of states—he pointed out that a national board of health nevertheless "could aid immensely in advancing the cause of sanitary progress." He declared:

> The semi-annual meetings of such a board would constitute a great school for study and a great center for disseminating education. The subjects discussed, the demonstrations made, and the data furnished at these meetings would yield a rich and ever-growing mass of scientific and practical information that could and would be applied to the prevention and extinction of diseases. Indeed, the recommendations of such a board would soon acquire a moral force and power more imperious than statutes, state or national.

But, the speaker emphasized, the effectiveness of such a national health set-up need not be limited to that due to moral influence alone. Any number, or all, of the states of the Union had the legal right, he added, "to form a compact and legally bind themselves to abide by the rules agreed upon."

In this way, he declared,

> . . . a national board of health could be the instrument of bringing about the enactment of public health and quarantine laws that would operate across state lines, a kind of legislative work that, in the absence of all public health power on the part of the federal government, can be accomplished in no other way.

And, let me repeat, Dr. Sanders was speaking, not in 1939 but in 1906!

This man was no dilettante; his mind was as thorough and logical as his habits were simple and austere, and he had but small patience with slack-minded thinking, writing, or talking. In debate, he was hardly the peer of Cochran in keenness, in spontaneity, or in the ability to compress in few words the essence of his subject; indeed in this regard, few men equalled or excelled Cochran.

Given a problem of moment, however, and more especially if the question involved medical organization—so thorough would be his analytical dissection, so lucidly and logically would he marshall his facts, that in the end but little ground was left his adversary upon which to stand.

Dr. Sanders's period of service was brought to an end by ill health on January 9, 1917. After nearly a year of release from his heavy burden, he breathed his last, "dying as he had lived," an admirer wrote, "quietly, stoically, bravely."

Fortunately for public health, Dr. Sanders's dream has been substantially realized. Through an ever widening of the manifold activities of the U. S. Public Health Service, through the splendid work of the Children's Bureau, and through the activities of the important group of state health officers, constituting the Conference of State and Territorial Health Officers, the federal government is exerting an increasingly powerful influence upon the health of our people.

The last of this quartet of eminent Alabamians whose labors were in the field of public health was Samuel Wallace Welch, graduate of Howard College, holder of the M. D. degree from the College of Physicians and Surgeons,

in Baltimore, and a post-graduate alumnus of Johns Hopkins University and the College of Physicians and Surgeons in New York City. It was he who, as Alabama's third State Health Officer, was called upon to carry the burden which had proved too heavy for the weakened shoulders of Dr. Sanders.

When it is remembered that his election occurred just about 3 months before the United States entered the World War, it is easy to comprehend some of the difficulties that beset him in his new work. For one thing, he found it a problem indeed to maintain his staff at proper efficiency in the face of volunteer enlistments and the operation of the draft law. Added to these difficulties was the increased menace to the public health that resulted from war conditions. Cantonments were springing up in Alabama as well as in neighboring states, adding to the danger of epidemics. Construction of these cantonments and other war work, paying boom-time wages, sent to Alabama a surging tide of civilian workers, taking with them, in many cases, the diseases with which they happened to be suffering when they left home. His success in dealing with this problem brought enthusiastic praise from those acquainted with it.

Like Sanders and Gorgas, Welch was an Alabama product. Like Sanders, but unlike Gorgas, he spent his entire life within the borders of his native state. The outstanding, the dominant note running through his entire life, was his intense humaneness. By reason of this human touch—marvelous and quite undefinable—he was able to infuse into Alabama's public health machinery, the same machinery which Cochran had carefully constructed a half century before, a *something* which seemed immediately to vitalize and humanize it and to make it workable far beyond the fondest dreams of its author. Reaching further out, he became one of the recognized leaders and workers in the various national health organizations.

He worked his magic spell upon members of the State Legislature and inspired in them a realization of the rich harvest to be reaped from a health policy properly directed and administered, and receiving adequate financial support. Thanks to that influence, it can be said, alike to the credit of the legislature and of the citizenship of the state, which heartily endorsed its action, that ample funds were appropriated for this great work, making possible needed expansion in public health organization, with a resulting and almost immediate effect upon the health picture of the state as a whole.

In the early morning of August 22, 1928, with little premonition of impending death, Dr. Welch died suddenly of angina pectoris. He appeared in his usual health prior to that fatal attack and attended to his regular duties the day before.

In conclusion, the writer considers it a rare privilege to have known personally 3 of the 4 of Alabama's public health leaders whom he has, so inadequately and sketchily, attempted to portray—Gorgas, Sanders, and Welch. The labors of the fourth—Cochran—antedated his coming to Alabama. His personal friendship and association with his immediate predecessors — Sanders and Welch—he places among the most valued treasures of his life.

Methods of Exposing Experimental Animals to Virus Infection Through Mosquito Vectors*

R. A. KELSER, PH.D., D.V.M., F.A.P.H.A.

Colonel, Veterinary Corps, U. S. Army, Surgeon General's Office, War Department, Washington, D. C.

IN 1933 it was discovered[1] that the mosquito *Aëdes aegypti* was capable of transmitting the virus of equine encephalomyelitis. Prior to that time the only very dangerous virus disease known to be conveyed by mosquitoes was yellow fever, and transmission experiments with that malady, during the past few years, have been carried on only to a relatively limited extent and by a very few research workers. The discovery of the rôle the mosquito might play in equine encephalomyelitis — as might be expected — gave considerable impetus to further work along this line with other species of the insect. Further, as the discovery referred to was the first proof of the ability of the mosquito to convey an essentially neurotropic virus, transmission studies have been undertaken with other viruses of this general type. Thus, with the virus of equine encephalomyelitis now definitely known to be pathogenic for man with a high mortality rate, there is emphasized the importance of conducting mosquito transmission experiments with this and similar viruses with the greatest of care.

In my work with the virus of equine encephalomyelitis and one or two similar viruses I employed a variety of methods for handling experimental mosquitoes and exposing animals to their bites.

For the maintenance of normal mosquitoes it has been our experience that stock or colony cages of fair size are preferable to the smaller sizes used for infected mosquitoes. Stock cages approximately 30″ wide, 26″ deep, and 30″ high are quite satisfactory. These are made of inch-square framing with a light-weight insulating board floor and covered with fine-mesh netting (bobinette). The frame and floor should be given two coats of white paint before the netting is tacked on. In putting the netting on the cages, white, ½″ binding tape will be found of value along the tack lines. The front of the cage (the 30″ side) has two 1″ square uprights each 10″ from the corner posts of the cage. A similar piece of wood is placed at right angles between the two center uprights 10″ up from the cage floor, and another piece in like position 10″ down from the roof. The square opening thus provided in the center of the front of the cage serves as a door.

After the rest of the cage is covered

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with bobinette a piece of the netting is tacked around the door and sewed, all in such a manner that the opening to the cage is protected by an 18″ long sleeve of bobinette which can be bunched and tied with tape.

Experimental feeding cages are smaller, and while they can be made in various sizes, two sizes which have proved very satisfactory are 22″ x 12″ x 12″, and 12″ x 8″ x 8″. As in the case of the stock cages these smaller models are constructed of 1″ framing, covered with bobinette, and have a floor of ¼″, light, insulating board. At one end of the cage the netting is extended about 1′ and the open seam sewed to make a sleeve. This sleeve can then be bunched and tied with a piece of binding tape and serves as the door of the cage.

All cage frames and floors are painted white before the bobinette is put on, and binding tape should always be used in tacking on the netting. It should be understood that white is prescribed for all parts of the cage in order that the mosquitoes may readily be seen wherever they happen to be in the cage.

In addition to the experimental feeding cages, feeding cylinders and globes are of considerable value under certain conditions. We have found straight-wall cylinders 3″ in diameter by 8″ long, as well as ordinary, white glass railroad lantern globes, very satisfactory for making mosquito feeding equipment.

In the case of the straight-wall cylinders a thickness of fine-mesh bobinette is stretched over one end of the cylinder and held tightly in place by a 1″ wide band of adhesive tape. A second, wider piece of adhesive tape should be used and so placed that half of its width overlies the first, and the other half made adherent to the glass cylinder. This is important in order to insure that the net covering the end of the cylinder will not slip off. To the other end of the cylinder there is similarly affixed a bobinette sleeve of essentially the same diameter as the cylinder and extending 6″ beyond the end of the glass. This can be bunched and tied with a piece of binding tape.

The lantern globes are fixed in much the same way as the straight-wall cylinders. The bottom (larger) opening of the globe is covered with bobinette stretched tight and held securely in place with adhesive tape as indicated in the case of the cylinders. The upper (smaller) opening is covered with a 6″ long sleeve comparable to the type described for the cylinder.

The sleeves provided for the cylinders and globes will be found of great service when it comes to placing mosquitoes in the apparatus, and especially when it is necessary to provide the mosquitoes contained therein with water or sugar solution.

It is also very desirable that there be provided, in addition to the cages, cylinders, and globes just described, a number of cages made with *wire* mesh and built a trifle larger than the bobinette-covered variety in order that the latter type cages, cylinders, and globes, when housing infected or supposedly infected mosquitoes, may be still further safeguarded. These wire covered cages are constructed with a door at one end which will admit the bobinette cage.

Another important requirement in experimental work with mosquito transmission of virus diseases is that a small, well screened, feeding room be available. This room should be provided with a vestibule entrance with double screen doors, and if possible a small exhaust fan should be installed near the floor level for rapid ventilation. The fan outlet should, of course, be properly screened. Where such a room is available it can be sprayed with an insecticide after feeding operations, closed for an hour or so, and then ven-

tilated. This serves as an added safeguard in work with infected mosquitoes. Further, if by any chance an accident should occur and infected mosquitoes escape from a cage the situation can be handled by immediately saturating the atmosphere with an abundance of insecticide and leaving the room closed for several hours.

For catching normal mosquitoes in stock cages and transferring them to experimental feeding cages, cylinders, or globes, we have tried a number of methods, but in our hands the use of 15 mm. cotton-plugged test tubes has proved most satisfactory. The procedure is carried out as follows: A technician puts on a pair of surgeon's rubber gloves, making sure that the cuff of each glove is pulled up over the sleeve of his laboratory gown and held in place with rubber bands. Twelve cotton-plugged test tubes are placed on the floor of the stock cage containing the mosquitoes. The sleeve constituting the door of the cage is made tight around the upper portion of the technician's clothed right arm through the use of several rubber bands. He can then pick up a test tube and remove the plug, aiding with his left hand on the outer side of the sleeve, and catch a resting mosquito by quickly placing the tube over it. The forefinger over the mouth of the tube prevents the mosquito's escape pending replacement of the cotton stopper. The tube is then laid on the floor of the cage and the process repeated. After a mosquito is caught in each of the 12 tubes the operator brings them out of the cage and the procedure is repeated with more tubes. After a little experience the average technician becomes very adept and can catch relatively large numbers of mosquitoes in a reasonable period of time.

This method seldom results in injury to the mosquitoes and where necessary each and every one entering into an experiment can be examined in the tubes, under magnification, for species identification. With this method it is easy to place the desired number of mosquitoes in cages, cylinders, or globes, with little chance of injury or escape.

The restraint and handling of experimental animals upon which mosquitoes are to be fed, present a number of difficulties, and great care must always be exercised in this part of the work. The author has found the following methods described as satisfactory as any he has worked with or seen used.

It is always good practice to shave the hair from the area of skin to be exposed to the mosquitoes. In the case of laboratory animals the site is ordinarily the belly wall. With horses the hair is usually shaved from a suitable area on the side of the neck. In all cases only warm water *without* soap should be used in shaving. The use of soap will retard mosquito feeding unless it is thoroughly removed.

Guinea pigs, rabbits, ferrets, monkeys, and dogs, are tied on suitable animal boards. The tape or tying cords are tied through holes drilled in proper places in the boards—no cleats, nails, or staples should be affixed to these boards as the bobinette covering of cages may be torn by them. After tying out any of the animals mentioned, bandage material (preferably muslin) is passed over the feet and around the board a sufficient number of times to insure against the possibility of the animal tearing the bobinette covering of the cage with its claws. This further serves to immobilize the animal more effectively.

Exposure to the mosquitoes is accomplished by placing, side down, on the shaved abdomen of the animal a feeding cage containing the desired number of mosquitoes. The floor of the cage should be toward the animal's head. While the bobinette of the cage

should be reasonably taut over the animal's belly the greater part of the weight of the cage should be supported by two pieces of wood cut to proper thickness for the purpose. There should always be at least one individual present during feeding operations and he should be constantly in position to adjust the cage or promptly remove it from the animal if circumstances require.

Where feeding cylinders or globes are used they are held in place over the shaved skin by the operator. Before starting feeding the bobinette sleeves of the cylinders or globes should be shaken to drive the mosquitoes into the glass compartments, the sleeves quickly twisted a little and folded taut over the side of the containers and held in place with rubber bands. This will prevent mosquitoes from getting up in the sleeves during feeding exposures.

Where horses or other large animals are utilized in mosquito transmission experiments, feeding cylinders or globes are ordinarily more easily handled in stalls or stables than cages.

It is, as in the case of smaller laboratory animals, important in working with the larger species that screened stalls or inclosures be provided for the mosquito feeding operations.

During feeding experiments with very small animals such as mice, special precautions are required to prevent tearing of the bobinette, particularly by the teeth. The best method we have found is to tie the mouse out on a small animal board, then place a piece of thin, fine-mesh copper gauze over its entire body, fitting it against the animal so that the belly wall is firm against the wire mesh. The edge of the copper gauze should be "bound" with a narrow strip of adhesive tape to guard against tearing the bobinette. After all is ready the sleeve of the mosquito cage, cylinder, or globe, is pulled out taut over the mouse in such a manner that the mosquitoes can come out in the sleeve, establish contact, and feed.

Occasionally one will be tempted to tie the mouse securely out on a small board and pass it directly into the mosquito cage. This makes for a satisfactory mosquito feeding but there is always great danger of mosquitoes escaping, especially when the mouse is removed. Further, if the animal does get loose—even if only a leg—a difficult situation may be encountered.

In conducting transmission experiments with a variety of species of mosquitoes it will be found that some are voracious feeders and will promptly bite and engorge under most any reasonable conditions. Other species will be found very fastidious as regards temperature requirements, the amount of light present, etc., and these must be given due consideration to accomplish satisfactory feedings. Some species will feed once and refuse at subsequent opportunities. Still others, with rare exceptions, and in spite of everything one might do, will die before feeding under experimental conditions. Irrespective of the species, it is ordinarily good practice to deny water or sugar solution to mosquitoes the day prior to feeding tests. The feeding room should always be warm—at least 80° F. It sometimes facilitates feeding, in the case of fastidious mosquitoes, if they are put in a cool place for an hour or so prior to taking them to the feeding room. Most species will not take a good blood meal more often than every third or fourth day, although there are some exceptions to this. As a rule, feeding of a group of mosquitoes should be accomplished within 20 to 30 minutes. Ordinarily those which do not feed within that time will not feed.

For our normal mosquitoes, and between blood feedings with experimental lots, we feed them on a 10 per cent sugar solution. In addition small bits of ripe banana are placed in the stock

cages. The sugar solution is placed in the cages in uncovered Petri dishes. A shallow dish of much smaller diameter is used in the cylinders and globes when fluid must be provided mosquitoes contained in them. In putting fluid in cylinders or globes they are first set in a white enamel pan and the empty dishes put in place with the aid of a long pair of straight dressing forceps. The fluid is then run into the dishes with a pipette carefully passed through the bobinette sleeve. In removing the dishes the fluid remaining in them is first drawn up in a vacuum bottle equipped with rubber and glass tubing, the latter, serving as a pipette, drawn out to a capillary point to prevent leakage. The dishes are then carefully taken from the cylinder or globes with the dressing forceps. It is essential that the sugar solution be changed at least every other day.

The main insectory should consist of several rooms or at least be adequately partitioned off in order that infected or supposedly infected mosquitoes may be kept separate from normal stock.

As you will readily appreciate, the few methods I have briefly outlined represent procedures which might be accomplished in some other manner by different individuals. I will repeat, however, that the methods I have described have proved very satisfactory and certainly are safer than a number of others employed in our earlier studies.

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Importance of Tabulating Multiple Causes of Death*

THEODORE A. JANSSEN, M.S.

Chief, Nosology Section, Division of Vital Statistics, U. S. Bureau of the Census, Washington, D. C.

STATISTICS relating to causes of death are derived for the most part from information reported on death certificates. Interpretation of these statistics should therefore be predicated upon an understanding of the characteristics peculiar to this type of information. For this purpose it is necessary not only to study the causes to which deaths are charged, namely, the primary causes of death, but also to investigate the frequency and importance of contributory or associated causes. To this end multiple cause tabulations, or tabulations showing associated and contributory causes in relation to those designated as primary, are indispensable.

During the early and formative years of the U. S. Registration Area death certificates contained much less information on causes of death than they do at the present time. In 1917, for instance, only 35.0 per cent of all certificates filed in the Registration Area reported more than one condition as cause of death. By 1925 this proportion had increased to 44 per cent, and by 1936 to 59.6 per cent. In fact, in 1936 almost 22 per cent of them contained not less than three conditions, as defined by the *International List of Causes of Death*. Thus, at the present time not less than 60 per cent of all death certificates annually filed in this country report more than one condition as a factor in the death.

Accompanying this tendency toward greater detail in the reporting of causes of death has been a salutory improvement in the quality of the information itself. The use of ambiguous and indefinite expressions has declined appreciably during the past decade. In general, certifying physicians seem to be taking a greater interest in the fact that the information which they supply on death certificates is the foundation upon which cause of death statistics are based. This quickened interest together with the increased public attention being directed toward the administration of health activities will no doubt result in even more information being made available on death certificates in the future.

In view of these facts it appears that multiple cause tabulations, or tabulations showing associated and contributory causes of death in relation to those designated as primary, are indispensable. To illustrate the importance of such tabulations, this discussion will deal with the reporting of multiple causes of death on certificates filed in the United States during 1936. Three main points will be considered. The first two relate to (1) geographic varia-

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[illegible] in multiple cause reporting, and (2) differences in the reporting of multiple causes on death certificates assigned to various causes of death. The third point concerns itself with the kind of information which can be made available by means of multiple cause tabulations.

TABLE 1

Reporting of Multiple Causes of Death in the United States — 1936

[illegible]	Percent of All Death Certificates Reporting			Average No. of Causes Reported per Certificate
	More than One Cause	Two Causes Only	Three or More Causes	
[illegible]	59.6	38.0	21.6	1.81
[illegible]	69.5	41.0	28.5	1.97
[illegible]	68.5	38.6	29.9	1.98
[illegible]	68.0	41.8	26.2	1.94
[illegible]	64.5	38.7	25.8	1.90
[illegible]	59.2	38.6	20.6	1.79
[illegible]	52.3	35.6	16.7	1.69
[illegible]	51.1	36.9	14.2	1.65
[illegible]	50.5	34.1	16.4	1.66
[illegible]	43.9	31.1	12.8	1.56
[illegible]	72.4	39.1	33.3	2.05
[illegible]	72.4	41.4	31.0	2.03
[illegible]	70.8	47.6	23.2	1.94
[illegible]	70.7	39.6	31.1	2.01
[illegible]	70.3	37.9	32.4	2.02
[illegible]	70.0	39.2	30.8	2.00
[illegible]	69.7	38.2	31.5	2.01
[illegible]	68.1	39.7	28.4	1.96
[illegible]	67.6	40.2	27.6	1.95
[illegible]	66.8	49.9	16.9	1.83
[illegible]	66.0	39.5	26.5	1.92
[illegible]	65.9	37.8	28.1	1.93
[illegible]	65.6	38.0	27.6	1.93
[illegible]	64.8	41.2	23.6	1.86
[illegible]	64.8	39.3	25.5	1.90
[illegible]	64.6	36.6	28.0	1.92
[illegible]	64.0	38.5	25.5	1.89
[illegible]	63.1	38.5	24.9	1.88
[illegible]	63.4	39.5	23.9	1.87
[illegible]	62.0	42.9	19.1	1.82
[illegible]	62.1	38.5	23.6	1.85
[illegible]	62.4	46.2	16.2	1.78
[illegible]	62.1	41.2	20.9	1.82
[illegible]	61.[illegible]	38.7	23.2	1.85
[illegible]	60.5	38.5	22.0	1.82
[illegible]	59.2	43.1	16.0	1.75
[illegible]	58.[illegible]	39.7	19.2	1.78
[illegible]	58.[illegible]	38.[illegible]	20.4	1.79
[illegible]	57.[illegible]	38.[illegible]	19.8	1.77
[illegible]	57.[illegible]	37.7	19.9	1.77
[illegible]	[illegible]	36.[illegible]	20.7	1.77
[illegible]	[illegible]	36.[illegible]	19.[illegible]	1.75
[illegible]	[illegible]	36.[illegible]	19.[illegible]	1.73
[illegible]	[illegible]	34.[illegible]	17.0	1.68
[illegible]	[illegible]	35.[illegible]	17.[illegible]	1.68
[illegible]	[illegible]	34.[illegible]	18.[illegible]	1.68
[illegible]	[illegible]	34.[illegible]	18.[illegible]	1.66
[illegible]	49.[illegible]	34.[illegible]	[illegible]	1.59
[illegible]	49.[illegible]	33.[illegible]	16.[illegible]	1.62
[illegible]	48.[illegible]	33.[illegible]	15.[illegible]	1.61
[illegible]	48.[illegible]	33.[illegible]	15.[illegible]	1.57
[illegible]	47.[illegible]	33.[illegible]	[illegible]	1.54
[illegible]	[illegible]	[illegible]	14.[illegible]	1.54
[illegible]	[illegible]	[illegible]	13.[illegible]	1.55
[illegible]	44.[illegible]	31.[illegible]	13.[illegible]	1.55
[illegible]	[illegible]	[illegible]	13.[illegible]	1.56
[illegible]	[illegible]	[illegible]	13.[illegible]	1.49
[illegible]	[illegible]	[illegible]	12.[illegible]	1.48
[illegible]	[illegible]	[illegible]	[illegible]	1.45

GEOGRAPHIC VARIATIONS IN MULTIPLE CAUSE REPORTING

The first point to be considered is whether death certificates filed in various parts of the country are uniform with respect to the number of causes reported per certificate. Table 1, based on information obtained from death certificates filed in the United States during 1936, shows that they are not. In the New England States, for instance, 69.5 per cent of all death certificates filed during 1936 contained more than one cause of death. In fact, 41 per cent of them reported two causes, while 28.5 per cent reported three or more. The average number of causes per certificate in this area therefore exceeded the average for the country as a whole by about 9 per cent. The Pacific and Middle Atlantic States rank quite close to the New England States in this respect.

On the other hand, only 43.9 per cent of the certificates filed in the East South Central States reported more than one cause. In this area 31.1 per cent reported two causes, but only 12.8 per cent contained three or more. The average number per certificate in this area was therefore approximately 16 per cent below the average for the country as a whole. The fact that death certificates filed in the South Atlantic and South Central States report fewer conditions than those filed in other areas may be attributed to the almost uniform lack of detail on certificates for Negroes.

Comparisons between individual states are even more striking. In New York and Connecticut, for example, 72.4 per cent of the certificates reported more than one cause, approximately 40 per cent reporting two, and about 32 per cent reporting three or more. The average number of conditions per certificate in these two states exceeded the average for the United States as a whole by about 11 per cent. At the other extreme are New Mexico and Arizona, in which only 37.2 and 35.6 per cent of the certificates reported more than one condition as cause of death. The average number of causes per certificate in these states was approximately 20 per cent below the average for the country as a whole. Further differences are evident within the individual states, especially between urban and rural areas, between areas populated predominantly by white people and those having a high proportion of Negroes, between cities having extensive hospital and medical facilities and those not so favorably endowed.

It may be concluded then that the information relating to cause of death as reported on death certificates presents a wide range of variation throughout the United States. In order that the effect of such variations may be evaluated in terms of the resulting statistics, multiple cause tabulations are necessary since they present data showing the relationship between the numerous combinations of causes reported.

DIFFERENCES IN MULTIPLE CAUSE REPORTING AMONG DEATH CERTIFICATES ASSIGNED TO VARIOUS CAUSES OF DEATH

Besides varying from one geographic area to another, the information reported varies according to the particular conditions involved. This is indicated by Table 2 which shows a comparison between the number of death certificates reporting or containing mention of certain causes and the number actually tabulated as due to these causes. In the case of typhoid fever (*International List No. 1*) the number of death certificates mentioning "typhoid fever" as a cause of death was 3,123. Of these only 25, or 0.8 per cent, were assigned to some cause other than typhoid fever. This close agreement accounts for the ratio of 1.01. In the case of "influenza with respira-

TABLE 2

Reporting of Multiple Causes of Death on Certificates Assigned to Certain Causes of Death — 1936

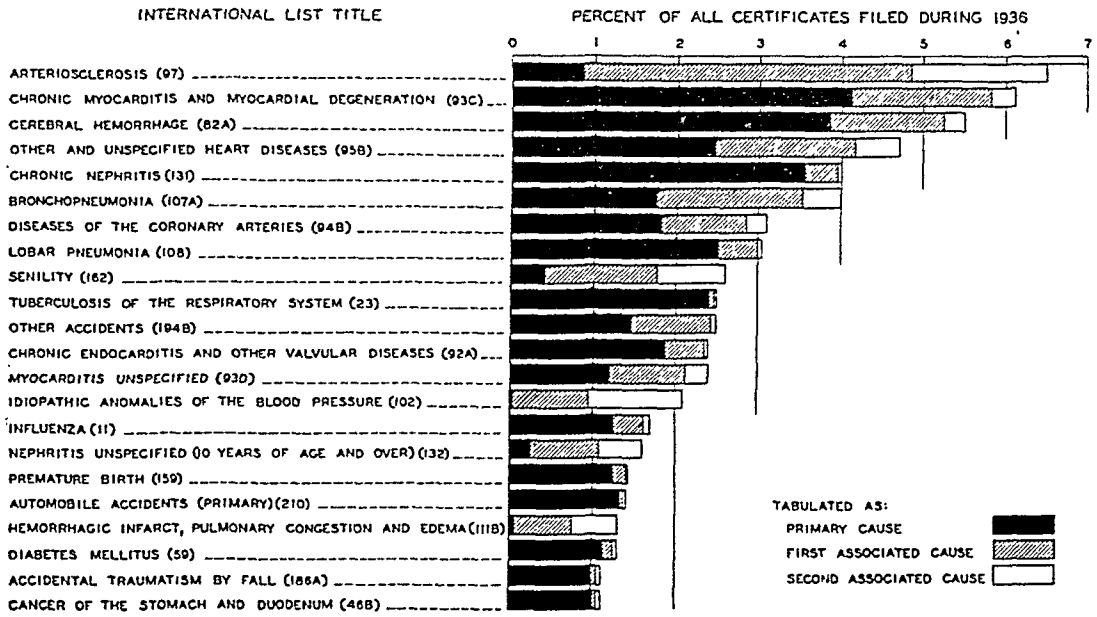
Int. List No.	*International List Title*	*Certificates Assigned to This Cause*	*Certificates Reporting This Cause*	*Ratio*
1	Typhoid fever	3,098	3,123	1.01
7	Measles	1,267	1,350	1.07
8	Scarlet fever	2,493	2,517	1.01
9	Whooping cough	2,666	2,783	1.04
10	Diphtheria	3,065	3,141	1.02
11	Influenza			
a	With respiratory complications specified	22,889	26,306	1.15
b	Without respiratory complications specified	10,922	17,306	1.58
13	Dysentery	3,122	3,700	1.19
23	Tuberculosis of the respiratory system	65,043	66,868	1.03
34	Syphilis	12,612	14,288	1.13
35	Gonococcus infection and other venereal diseases	772	933	1.21
46B	Cancer of the stomach and duodenum	27,241	28,192	1.03
46C	Cancer of the intestines	15,364	16,741	1.09
47A	Cancer of the larynx	1,239	1,383	1.12
47B	Cancer of the lungs and pleura	4,648	10,048	2.16
53C	Cancer of the brain	1,284	2,003	1.56
59	Diabetes mellitus	30,406	33,507	1.10
75	Alcoholism	3,714	8,048	2.17
91a	Acute endocarditis	2,951	5,758	1.95
92a	Chronic endocarditis and other valvular diseases	50,529	63,532	1.26
93a	Acute myocarditis	5,086	11,201	2.20
93c	Chronic myocarditis	110,654	156,194	1.41
94b	Diseases of the coronary arteries	48,622	76,677	1.58
107a	Bronchopneumonia	46,965	94,761	2.02
108	Lobar pneumonia	67,778	80,630	1.19
109	Pneumonia unspecified	4,312	12,463	2.89
130	Acute nephritis	4,161	11,395	2.74
131	Chronic nephritis	95,828	106,540	1.11
132	Nephritis unspecified (10 years of age and over)	6,876	29,230	4.25
140	Abortion with septic conditions	1,801	2,036	1.13
141	Abortion without mention of septic conditions	680	1,225	1.80
146	Puerperal albuminuria and eclampsia	2,235	2,638	1.18
147	Other toxemias of pregnancy	549	1,121	2.04
179	Other acute accidental poisonings	1,465	1,623	1.11
190	Excessive cold	579	908	1.57
191	Excessive heat	4,678	8,914	1.91

tory complications," however, the ratio is much larger, viz, 1.15, indicating that approximately 13 per cent of the death certificates mentioning " influenza with respiratory complications ". were actually tabulated under some other cause of death. Other causes listed in the table show still greater ratios, such as alcoholism 2.17, acute endocarditis 1.95, acute myocarditis 2.20, diseases of the coronary arteries 1.58, bronchopneumonia 2.02, lobar pneumonia 1.19, and acute nephritis 2.74. Since many of the conditions listed in the table are frequently reported as complications of other diseases, these relatively high ratios are to be expected.

Figure 1 further illustrates the variation in the amount of detail reported on death certificates assigned to various causes of death. The figure shows, for instance, that arteriosclerosis (I. L. 97) was reported on 6.5 per cent of all certificates filed in the United States during 1936. However, only 0.8 per cent were assigned to arteriosclerosis as the primary cause of death, indicating that in the vast majority of cases it was reported as an associated or contributory condition. This is to be expected since a large proportion of deaths occurring among people of advanced age involve arteriosclerosis. Similarly, chronic myocarditis (93c) was reported on 6.1 per cent of all certificates, while 4.1 per cent were actually assigned to

FIGURE 1

PROPORTION OF CERTIFICATES REPORTING CERTAIN CAUSES OF DEATH TABULATED AS DUE TO THOSE CAUSES



this cause. In the case of tuberculosis of the respiratory system this difference is relatively small, since about 97.2 per cent of the certificates mentioning this disease are actually assigned to it. Other causes of death show various proportions in this respect, some indicating that practically all certificates reporting certain causes are actually tabulated as due to those causes, others indicating that the majority of cases are assigned to some other cause mentioned on the same certificate.

From these observations it again becomes evident that the character of the information reported on death certificates presents considerable variations. For proper interpretation of cause of death statistics the extent of these variations should be investigated, especially since the whole problem of joint cause selection is involved. Thus, any contemplated change in the basic criterion or definition according to which the primary cause of death is determined could be evaluated in terms of statistical frequencies.

INFORMATION WHICH CAN BE MADE AVAILABLE BY MEANS OF MULTIPLE CAUSE TABULATIONS

On the basis of the foregoing observations it appears that a considerable body of information is reported on death certificates which lends itself well to various purposes. In the first place, information on contributory or associated causes is valuable in the planning of well rounded preventive programs since it is essential to know the total incidence in fatal cases of the various diseases and conditions responsible for mortality. Second, statistics showing combinations of causes come nearer the truth than do those based on the single cause principle because the majority of deaths actually result from combinations of causes. Third, multiple cause tabulations would obviate to a great degree the difficulties involved in setting up and applying a joint cause selection system for determining the one individual cause under which each death is to be tabulated when more than one cause is reported.

TABLE 3A[1]

Comparison Between Number of Certificates Reporting Puerperal Conditions and the Number Actually Tabulated as Maternal Deaths, Showing Also the Distribution of Puerperal Conditions as Contributory or Associated Causes — 1936

Int. List No	International List Title	Certificates Assigned to This Cause	Certificates Reporting This Cause	Ratio	Primary Cause Under Which Puerperal Conditions Were Tabulated as Contributory or Associated Causes												
								142		144							
					N.P.[3]	140	141	a	b	a	b	145	146	147	148	149	150
Total	Diseases of pregnancy, childbirth, and puerperal state	12,182	13,675[2]	1.12	1,493	197	196	21	204	320	867	1,679	1,550	262	473	175	18
140	Abortion with septic conditions	1,801	2,035	1.13	234	..	..	..	..	..	..	..	..	..	..	..	..
141	Abortion without mention of septic conditions	680	1,220	1.79	236	..	..	..	..	35	5	..	133	60	73	..	..
142a	Ectopic gestation, with septic conditions specified	100	101	1.01	1	..	..	..	..	..	..	..	..	..	..	..	..
142b	Ectopic gestation, without mention of septic conditions	386	390	1.01	4	..	..	..	..	..	..	..	..	..	..	..	..
143	Other accidents of pregnancy	80	1,069	13.36	410	..	..	..	1	10	30	47	378	53	56	4	..
144a	Placenta praevia	400	455	1.14	9	5	2	..	..	..	..	30	..	..	..	..	..
144b	Other puerperal hemorrhages	998	1,796	1.80	20	79	194	13	172	122	..	148	..	..	..	50	..
145	Puerperal septicemia and pyemia (including tetanus)	2,705	2,748	1.02	43	..	..	..	..	..	..	..	..	..	..	..	..
146	Puerperal albuminuria and eclampsia	2,235	2,636	1.18	131	40	..	1	10	15	60	140	..	..	..	4	..
147	Other toxemias of pregnancy	540	1,117	2.03	69	29	..	1	3	5	39	76	340	..	..	6	..
148	Puerperal phlegmasia alba dolens, embolus, sudden death	567	994	1.75	20	44	..	4	15	16	41	123	33	22	..	109	..
149	Other accidents of childbirth	1,635	4,974	3.04	300	..	..	1	3	119	692	1,084	663	123	336	..	18
150	Other and unspecified conditions of the puerperal state	46	102	2.22	16	..	..	1	..	..	..	22	3	4	8	2	..

[1] Figures in this table include only the first two significant causes as defined by the rubrics of the Fourth Revision of the *International List of Causes of Death* (1929), and as determined by the *Manual of Joint Causes of Death* (1933).

[2] This figure is not a summation of the column, but represents the total number of certificates which reported any cause of death classified under titles 140 to 150.

[3] N.P. = Nonpuerperal.

TABLE 3B

Deaths Assigned to Nonpuerperal Causes Which Reported Puerperal Conditions as Contributory or Associated Conditions — 1936

Int. List No.	International List Title	Total	Nonpuerperal Cause Under Which Puerperal Conditions Were Tabulated as Contributory or Associated Causes															
			A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
Total	Diseases of pregnancy, childbirth, and puerperal state	1,493	73	147	223	63	38	63	35	34	170	216	135	163	71	6	205	51
140	Abortion with septic conditions	234	9	..	..	13	..	10	1	..	..	1	1	..	1	..	188	10
141	Abortion without mention of septic conditions	236	7	35	3	9	8	12	5	..	25	77	34	..	9	2	2	8
142	Ectopic gestation	5	..	2	1	..	..	..	2	..	..	..	..	..	..	..	..	..
143	Other accidents of pregnancy	410	1	26	5	2	8	16	6	30	87	132	42	19	30	3	..	4
144a	Placenta praevia	9	..	2	..	2	..	..	2	..	..	..	2	..	..	..	..	1
144b	Other puerperal hemorrhages	20	..	2	..	3	..	1	2	..	..	..	1	..	..	..	5	6
145	Puerperal septicemia and pyemia (including tetanus)	43	21	..	..	12	..	2	3	..	..	..	..	..	..	..	3	2
146	Puerperal albuminuria and eclampsia	131	4	7	1	6	..	2	1	..	1	..	11	84	3	..	2	8
147	Other toxemias of pregnancy	69	2	4	..	2	..	1	2	..	..	2	22	27	4	..	2	1
148	Puerperal phlegmasia alba dolens, embolus, sudden death	20	3	5	..	1	..	1	..	..	..	..	4	..	1	..	3	2
149	Other accidents of childbirth	300	24	62	13	12	22	16	10	4	55	4	15	32	22	..	..	9
150	Other and unspecified conditions of the puerperal state	16	2	2	..	1	..	2	1	..	2	..	3	1	1	..	..	..

A = Scarlet Fever
B = Tuberculosis of the Respiratory System
C = Other Tuberculosis
D = Syphilis
E = Malaria
F = Other Infectious and Parasitic Diseases
G = Cancer and Other Malignant Tumors
H = Diseases of the Nervous System
I = Diseases of the Circulatory System
J = Pneumonia (all forms)
K = Diseases of the Digestive System
L = Chronic Nephritis
M = All other diseases
N = Suicide
O = Homicide
P = Accidents

As an example of the type of statistical data which becomes available through the tabulation of multiple causes of death, Tables 3A and 3B are presented. Table 3A shows two important facts: (1) there were actually 13,675 * deaths reported during 1936 as involving diseases of pregnancy, childbirth, or the puerperal state, while published reports show 12,182, or only 89.1 per cent of this total; (2) each of the individual conditions making up this particular group of causes was reported much more frequently than is shown by the usual statistical tabulations. For instance, 1,801 deaths were charged to "abortion with septic conditions" (I. L. 140) during 1936. It appears, however, that septic abortion was actually reported on 2,036 certificates. The resulting ratio of 1.13 indicates that about 11.5 per cent of the death certificates reporting abortion with septic conditions were actually tabulated under some other cause of death. In the case of "abortion without mention of septic conditions" (I. L. 141), the difference is still greater, since only 680, or 55.5 per cent, of the 1,225 certificates reporting this condition were actually tabulated under this cause. In the aggregate, therefore, almost 24 per cent of all certificates reporting abortion as a factor in the death are tabulated under some other cause. Table 3A further shows that 1,493, or 10.9 per cent, of the certificates reporting maternal causes during 1936 were not tabulated as maternal deaths. The question immediately arises as to how they were tabulated. This is shown by Table 3B, from which it can be seen that 50 per cent of these cases were charged to pneumonia (I. L. 107–109), homicide (I. L. 175), tuberculosis (all forms), (I. L. 23–32), and chronic nephritis (I. L. 131). The remaining 50 per cent were tabulated under a wide range of primary causes.

* This figure includes only cases in which puerperal conditions were tabulated as primary or "first significant contributory or associated causes."

INTERNATIONAL CONSIDERATIONS

The desire for international comparability led to the adoption of the *International List of Causes of Death* in 1900 as the official system for classifying causes of death in this country. For several reasons, however, it is incorrect to assume that the use of this system assures true international comparability. First, the habits of physicians in reporting causes of death vary considerably from one country to another. Second, questions used on the death certificate for obtaining information on causes of death are different. Third, responsibility for reporting the cause of death in some countries rests entirely upon physicians, coroners, and medical examiners, while in others this is not the case.

In addition, the reporting of multiple causes of death varies quite markedly between different countries. An indication of this fact is contained in Table 4.

Still another factor leading to differences between the cause of death statistics of different countries results from the methods used in determining the primary cause of death for tabulation purposes. In one study [1] relating to this problem, it was shown, for instance, that in 1,032 identical cases submitted to 18 different countries, the average agreement in selection of the primary cause of death was approximately 57.5 per cent. It appears therefore that at least part of the wide international variations in death rates for specific causes may be attributed to the methods by which the primary causes were selected for tabulation. This emphasizes the necessity for obtaining international comparisons on the basis of multiple causes in order that the effect of the respective joint cause selection systems may be evaluated.

TABLE 4

Proportion of Death Certificates Reporting More Than One Cause of Death in Certain Countries

Nation	Year	Total Deaths	Death Certificates Reporting More Than One Cause	
			Number	Per cent
United States	1936	1,479,228	881,972	59 6
Panama Canal Zone *	1936	582	317	54.5
Scotland (6 Mo.)	1937	31,038	10,546	34.0
Canada	1931	104,517	34,562	33.1
Netherlands	1936	70,613	21,985	31.1
Greece †	1936	23,984	2,884	12.0
Denmark	1937	40,442	483	1 2

* Deaths reported from hospitals only
† Deaths reported from municipalities and some cities having population of 10.000 or more

CONCLUSION

Since death certificates now report much more detailed information than they did some years ago, and since there is an increasing demand for more detailed knowledge of the many combinations of diseases and conditions which cause death, the Bureau of the Census proposes to code and tabulate multiple causes of death annually beginning with the certificates filed during 1941. This means that for all certificates reporting two or more conditions as causative factors in the death, the primary and one associated or contributory cause will be coded and tabulated. In addition, special studies will be undertaken whenever possible, with a view toward making still more detailed information available for the more important causes of death. One such report has recently been published, namely, *Deaths from Alcoholism and Associated Causes*, and others of a similar nature are contemplated. It is hoped that these proposals relating to the tabulation of multiple causes of death will find a ready acceptance among those who make use of vital statistics data.

REFERENCE

1. Janssen, T. A., and Dunn, H. L. Classification of Joint Causes of Death. *Vital Statistics Special Reports*, Vol. 5, No. 47 (Aug. 30), 1938.

Public Health Aspects of Unrestrained Advertising*

K. E. MILLER, M.D., F.A.P.H.A.

Medical Director, U. S. Public Health Service; Medical Adviser to the Federal Trade Commission, Washington, D. C.

UNRESTRAINED advertising becomes a matter of public health concern primarily in connection with those products which either directly or indirectly affect health—namely, foods, drugs, cosmetics, and the so-called health devices or "gadgets." On the whole, it it found that health workers have but slight acquaintance with what is commonly called food and drug work, and such as they do have is colored by the angle from which it is viewed. In fact, the work itself varies in accordance with the level of its application. In local health service this work consists almost wholly of food sanitation, and has to do more specifically with perishable foods. As such it probably has more of an esthetic than an actual health value. On the state level it assumes somewhat greater importance. Here food standards are defined and enforced, and it is here that the regulation of traffic in proprietary drugs and medicines acquires an important rôle. To a certain extent, also, cosmetics and health devices are given attention, especially where obvious fraud is involved. It is not, however, until the federal level is reached that the maximum effectiveness in control of this whole group of health and beauty aids is realized.

In its relationship to state health organizations, food and drug work occupies a variable and dubious position. Whether by consent of the state health agencies or otherwise, the fact remains that food and drug control is vested in the state health authority in only 19 states. In 18 states it is administered by the state department of agriculture; in 5 states this function is exercised jointly by the health and agricultural agencies; in 11 states by boards of pharmacy or other agencies; and in 4 states there is no agency specifically charged with this duty. This situation is not as strange as it may seem. It will be recalled that the pioneer agency of the government in the development of this work was the Department of Agriculture in 1906. The state machinery for handling this work has in many instances been copied directly from the federal set-up.

In all probability the only direct contact that most of the state officials have had heretofore with this program in the federal government has been almost exclusively with the Food and Drug Administration of the Department of Agriculture. It may therefore be a bit odd to learn that there are other agencies of the government having certain definite responsibilities with respect to

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drugs and similar products sold in interstate commerce. The list includes the following:

1. Food and Drug Administration of the Department of Agriculture, whose duty it is to regulate misbranding and adulteration.
2. The Post Office Department, which has control of fraudulent material transmitted through the mails.
3. The Public Health Service, which exercises control over the standardization of sera, vaccines, and analogous products.
4. The Federal Trade Commission which has jurisdiction over false, misleading, and fraudulent advertising.

The remainder of this discussion will be confined to that phase of this multisided problem which has to do with advertising. To narrow it down further, it will be pointed out that drugs and cosmetics are in essentially the same category, and that foods and health devices have relatively less direct health significance from the standpoint of interstate advertising. Consequently, the major cause for concern arises from the false advertising of drugs, including cosmetics.

Advertising may be either a great asset or a great liability in human affairs. While this observation is true of all advertising, there is no branch of the enterprise in which it applies with more force than in the advertising of drugs and allied products. Gigantic indeed is the volume of advertising relating to products having real health significance, but the health theme is played upon in a vast number of instances in which health is no real factor at all. With the ever advancing prestige and popularity of public health, it is natural that a saprophytic growth of pseudo health issues should attach itself to the genuine stem.

It was 25 years ago when the Federal Trade Commission came into the field to exercise, among other functions, jurisdiction over false advertising. Its fundamental purpose was the elimination of unfair trade practices, of which false advertising is an important part. Under the original act creating the Federal Trade Commission and prescribing its functions and powers, monumental advancements were made in the elimination of false advertising of health and beauty products. The Commission, however, labored under certain handicaps. In order to sustain a complaint against an advertiser, for illustration, it was formerly necessary to prove two things: (1) that the advertising was injurious to the interests of a competitor; and (2) that in the correction of such injurious practice a public interest was being served. It was not always easy or even possible to establish injury to a competitor, though the advertising may have been undeniably false and misleading. In order to facilitate the procedure against false advertising therefore an amendment to the original act was drawn up and passed in May, 1938. This is known as the Wheeler-Lea Amendment.

The amendments to the Federal Trade Commission Act supplement and materially strengthen the powers contained in the organic Act of 1914. Section 5 of the original Act declared "unfair methods of competition in commerce" to be illegal, and vested the Commission with a formal procedure against those engaged in such methods, culminating in an order to cease and desist. It will be seen that this provision was designed to protect the public by assuring it the benefits of free and honest competition among those engaged in business.

The courts, however, in construing the term "unfair methods of competition" held that although a method was established as unfair, and as injurious to the public, unless it could be shown that actual or potential legitimate competition was injured by its use, the Commission was without jurisdiction. Principally the amendment to Section 5 was drawn to remedy this situation by

removing the requirement of showing injury to competitors and emphasizing, rather than changing, the Commission's duty primarily to protect the public. This was done by adding the words "or unfair or deceptive acts or practices in commerce" to the phrase "unfair methods of competition in commerce."

The Wheeler-Lea Amendment has several features with which the public health profession should be acquainted:

1. It defines false and misleading advertising in terms which are so significant that they are herewith quoted as follows:

"The term 'false advertisement' means in advertisement, other than labeling, which is misleading in a material respect; and in determining whether any advertisement is misleading, there shall be taken into account (among other things) not only representations made or suggested by statement, word, design, device, sound, or any combination thereof, but also the extent to which the advertisement fails to reveal facts material in the light of such representations or material with respect to consequences which may result from the use of the commodity to which the advertisement relates under the conditions prescribed in said advertisement, or under such conditions as are customary or usual. No advertisement of a drug shall be deemed to be false if it is disseminated only to members of the medical profession, contains no false representation of a material fact, and includes, or is accompanied in each instance by truthful disclosure of, the formula showing quantitatively each ingredient of such drug."

2. It places special stress upon products which may be injurious to health by providing for:

(a) Procedure by injunction where immediate danger to health may be involved. The Commission also pursues the policy of mandatory complaint against products considered injurious to health, thus excluding their advertisers from the privilege of settlement by voluntary stipulation.

(b) A criminal penalty, including a fine of $5,000 and/or 6 months imprisonment for the first offense and double these amounts for the second offense.

3. The criminal penalty and injunctive provisions also extend to cases involving fraudulent advertising.

It should be noted, however, that the Commission has no power to exclude any product from the market. Its authority is limited to the issuance of a cease and desist order inhibiting the use of specified false and misleading claims, and claims of like import. When it becomes necessary to conduct prosecution for violation of the Commission's orders this is done by the Department of Justice, upon request from the Commission.

The volume of business in foods, drugs, cosmetics, and devices alleged to improve health, I will not attempt to estimate in figures since there are no accurate statistics on this subject. It may be stated with confidence, however, that the traffic in this group of products is of the magnitude of a major industry. There must be exceedingly few persons in these United States who are not at some time during the course of a year affected either for good or ill by products belonging to this group. In this connection two questions naturally arise: (1) Is the money profitably invested? (2) Is there any harm derived from such purchases?

It is not my purpose to discuss the economic side of this subject. The public health is not directly affected by the fruitless expenditure of money, though this does have an indirect bearing upon the public health problem, since the more we spend for no good purpose, the less there will be available for legitimate health protection. The fact remains, however, that the principal issue is question 2—as to harmful effects from falsely advertised medicines. Some are quite devoid of harmful effects when used under conditions which are customary or usual, while others are not. The true differentiation between harmful and harmless, however, is not to be found by consulting the morbidity and mortality records. Even where potent drugs may be the direct cause of deleterious or fatal

effects, the situation is rarely so diagnosed and recorded. Also there are various degrees of toxicity ranging from a chronic low grade poisoning to acute and severe reactions menacing to health and life. In some instances chronic poisoning may, because of its insidious nature, be more detrimental even than acute intoxications.

As an illustration of the class of preparations against which the Commission has already proceeded on the ground of harmful effects, the following excerpts from the formal complaints of the Commission in application for temporary injunction are cited.

1. A fat-reducing remedy: D. 3609

"The representations contained in the advertisement hereinabove set out, and in other advertisements similar thereto but not set out herein, are false, misleading and untrue. This preparation is not widely prescribed by practicing physicians as an aid in reducing weight. Many ill effects are often experienced from its use. Said advertisements of respondents are also false in that they fail to reveal that the use of this product under the conditions prescribed in said advertisements, and under such conditions as are customary and usual, may be injurious to the health of the user thereof by causing loss or serious impairment of eyesight and in other ways injuring or impairing the functions of the human body.

"The true facts are that the active agent contained in said preparation '281' is the drug dinitrocresol. This drug is a powerful stimulator of body metabolism. Through the accelerated metabolism rate caused by the use of this drug body tissues, particularly fat, are more rapidly destroyed. This drug, however, has a marked toxic effect, causing, in some cases, direct degenerative changes in the vital organs and the formation of bilateral cataracts on the eyes of the persons subjected to its use."

2. An abortifacient remedy: D. 2934

"The Commission finds that the representations hereinbefore set out and other representations similar thereto not set out herein, appearing in respondent's advertisements, are false, misleading and untrue. This preparation is not a competent, safe nor scientific treatment for delayed menstruation. It is not recommended by physicians. Said advertisements of respondent are also false in that they fail to reveal that the use of these preparations under the conditions prescribed in said advertisements and under such conditions as are customary and usual may result in the serious illness, and in some cases, in the death of the user.

"The true facts are that the use of either of these preparations may result in gastro-intestinal disturbances such as catharsis, nausea and vomiting with pelvic congestion, inflammation and congestion of the uterus and adnexa leading to excessive uterine hemorrhage, and in those cases where either of these preparations is used to interfere with the normal course of pregnancy, may result in uterine infection with extension to other pelvic and abdominal structures causing septicemia or blood poisoning."

The drugs employed in this case include ergotin, extract of cotton root bark, extract of black hellebore, aloes, oil of pennyroyal, oil of savin, and quinine sulfate, all of which are common ingredients of abortifacient preparations. Other drugs contained in many similar abortifacient remedies against which the Commission has instituted injunction proceedings include ergot, apiol, and oil of tansy.

3. A liquor habit cure: D. 3735

"The representations hereinbefore set out and other representations similar thereto but not set out herein appearing in respondents' advertisements are false, misleading and untrue. This preparation is not a competent, safe or scientific treatment for alcoholism. Its use may have ill effects upon the human body. Said advertisements of respondents are also false in that they fail to reveal that the use of this product, under the conditions prescribed in said advertisements, and under such conditions as are customary and usual, may result in the serious illness and in some cases the death of the user.

"The true facts are that the preparation *Alcoban* contains the following active ingredients:

Emetine Hydrochloride
Ephedrine Hydrochloride
Pilocarpine Hydrochloride

"Each of these drugs is in itself potent and harmful, and when combined with the others as in this preparation results in a compound which may have marked toxic, and in some cases fatal, effects upon the human system."

It is worthy of note that thus far no application for temporary restraining order has been denied by the federal courts.

In addition to the foregoing class of drug preparations there is another and much more extensive group in which harmful effects may or may not be expected. While danger is not inherent in their use, nevertheless, they cannot always be truthfully represented as unqualifiedly safe. Neither safety nor danger in drug therapy is absolute. Both of these factors are relative, depending upon a variety of conditions such as age and physical condition of the patient, size and frequency of dosage, and duration of the treatment. But with all due allowance for these variable quantities, there will still be encountered not a few instances wherein injurious effects may result from many of the commonly advertised remedies. In this list belong certain products such as: analgesics or painkillers, nerve sedatives, contraceptives, cold cures, epileptic cures, drink habit cures, rheumatic remedies, purgatives, hay fever and asthma remedies, depilatories, hair dyes, and skin bleaching preparations. Although the foregoing list is decidedly abridged, it will not be practicable to discuss each one of these items in detail.

It has been previously noted also that even nontoxic drugs may have a public health significance, when relied upon for virtues which they do not possess. It is a notorious fact, for example, that tuberculosis, cancer, chronic kidney diseases, heart disease, and other similar disorders are preceded by prolonged incipient or prodromal stages during which the symptoms may be quite indeterminate and variable. It is during this period that the credulous public become victims of worthless and sometimes even toxic nostrums, losing whatever opportunity they might have had for averting impending doom until it is too late for competent medical service to be of any avail. Another splendid example is found in the worthless diabetic cures. The public health world would be shocked to know of the number of fake diabetic remedies which are being relied upon by scores of thousands of Americans for relief from diabetes, and which can only result in disaster.

If it were within the scope of this discussion to trace the public health implications connected with all drug products used in self medication they would indeed form an impressive array, but all I can hope to do at this time is to establish in the minds of public health workers the fact that drug control as it pertains to preparations sold to the public for self administration is a major public health problem which must be reckoned with as such. Over and above the immediate dangers to health, the mass of misinformation and downright falsehood that is being carried in advertising columns concerning health is a challenge to the energy and ingenuity of health agencies to set the public aright.

Frequent reference has been made in this discussion to hazards associated with self medication. In order that there shall be no misunderstanding on this subject, I should like to state what I consider to be the rational attitude toward this matter. It is believed to be sound doctrine that the diagnosis and treatment of all human ills can best be accomplished by a competent physician. It does not, however, follow that self medication has no place in our social order. Many of the simpler ailments are too trivial to justify a requisition upon the time of a skilled physician who has more serious duties to occupy his attention. In many instances, also, a physician is not immediately available to render emergency or first aid treatment. Moreover, under the prevailing system of medical prac-

tice, the difference in cost of a physician's services as compared with home remedies may decide the issue as to whether the patient is to receive some degree of relief from his ills or none at all. And finally, regardless of its limitations, self medication is the inalienable right of Americans. But when drugs are placed at the disposal of laymen for self medication, it is their right to know the unalloyed truth as to what may properly and reasonably be expected from their use. Furthermore, the public should be warned in every possible way and safeguarded against the use of drugs which may be harmful when used without adequate medical supervision. These are the items for which advertising should be held accountable.

It has already been recognized that the first line of defense against false and misleading advertising of health and beauty aids rests with the Federal Trade Commission. I would not, however, leave the impression that the states have no part to play in this program. There are, on the contrary, certain very important contributions which the state health departments can and should make. Some of these include the following:

1. It would be in the interest of efficiency if state regulations were revised, if necessary, so as to be both complementary and supplementary to the federal laws as regards unfair or deceptive acts or practices in advertising of foods, drugs, cosmetics, and devices.

2. Also, state regulations should be such as to control the sale of those drugs which are sold over the counter without any advertising and where the laws governing misbranding and adulteration are not involved.

3. Whenever trial on a complaint by the Federal Trade Commission is scheduled, it becomes necessary to secure competent medical testimony. The Federal Trade Commission must appeal to some agency within the state to assist in obtaining the services of suitable medical authorities. This function can be performed either by the state health agency or the state medical association. As a matter of fact, it has been performed by both with a high degree of satisfaction. Since this phase of the proceedings is often the most essential link in the chain, it will readily be seen that in arranging for this service a highly important contribution is made.

4. The better classes of publishers of newspapers and magazines are anxious to clear out falsehood and misrepresentation from their advertising. Local publishers should, therefore, be encouraged to seek the advice of state and local health officers with respect to legitimate claims in the advertising of medicinal and allied products, and should be induced, if possible, to exclude from their columns all advertising which may be false or even questionable.

5. Not the least of the contributions that can be made by state and local health agencies to the drug control program is through the educational approach. Complete effectiveness will never be accomplished by law enforcement alone. If the people are made aware of the truth they may be relied upon to do their part. But to convey the truth to others the health agencies must first know the truth themselves. It is suggested that the most fruitful source of such information is found in the federal agencies concerned with this problem. Speaking for the Federal Trade Commission, I have reason to believe that this organization would be happy to supply all interested health agencies with copies of all stipulations and cease and desist orders, which clearly define the grounds upon which official action is taken. Were the pertinent facts in this material to be re-

layed to the public by the health agencies, and followed up by appropriate comment, an enlightened popular interest in these problems would be expeditiously achieved. The public must be made advertising-conscious and label-conscious, so as to recognize fallacy and deception. This is a job which only the health agencies can perform.

SUMMARY AND CONCLUSION

1. The hazards associated with falsely advertised foods, drugs, cosmetics, and devices are such as to constitute a major health problem.

2. One of the most potent means for regulating unfair practices and protection of the public health interets is found in the control of false and misleading advertising, and the advertising of products which may be dangerous to health.

3. The responsibility for such control rests primarily with the federal government, whose laws are now reasonably adequate to meet the demands.

4. As the second line of defense the state and local health agencies have certain very important supplementary duties to perform. To this end the state laws should, as expeditiously as possible, be revised and modernized so as to conform with and supplement the federal laws. But even without any changes in the existing state laws, state and local health forces can make many vital and indispensable contributions to the success of the campaign against dangerous nostrums and the false advertising of other medicinal products.

The Federal Works Agency and Public Health

JOHN M. CARMODY

Administrator, Federal Works Agency, Washington, D. C.

ACTIVITIES of the Federal Works Agency in the field of public health comprise construction programs under the PWA, and construction and service programs under the WPA. The recent grouping of these two agencies (together with United States Housing Authority, Public Buildings Administration, and Public Roads Administration) under the new Federal Works Agency will make it possible to attain greater efficiency and economy in operation of projects.

Public health activities carried on by WPA and PWA are very extensive, as the members of the American Public Health Association know from direct experience. A report on those activities, however, may be of interest to them not only in the light of recent legislation by the Congress, but also in the light of the controversy now going on among physicians, health officers, and other interested persons upon the whole matter of federal activity in public health.

Your former president, the Surgeon General, stated the essential fact about federal participation in public health work in a speech before the A.P.H.A. three years ago:

> We may have confidence not only in objectives of today's national health program, but also in its method. The federal-states relationship in public health functions smoothly because we merely are extending a well established procedure. In 1880 the Congress authorized the Public Health Service to cooperate with states in the prevention and control of epidemic diseases. The mechanism of such coöperation has been worked out during the past 56 years. We can cite this half century of federal-states relationship in public health in support of the soundness of the principle, in the flexibility of action which is permitted, and in the avoidance of overcentralization.

Our newer federal agencies have in some respects erred in their application of this principle to specific cases, but they are learning from experience, and in the future they will rely to an even greater degree upon the experience of the U. S. Public Health Service. Thus they will guard against certain evils likely to exist in a program involving the expenditure of great sums of money. Haste is one of those evils; insufficient study of needs is another; insufficient review of proposed projects is a third. Before summarizing the programs already conducted, therefore, I feel that it should be stated that such criticism of PWA hospital projects as have already been made are salutary and necessary if we are to avoid overbuilding or ill-advised building in a program of such great importance. The Federal Works Agency invites and welcomes thorough study of its construction program in the field of health and will coöperate with medical authorities in adapting that program as efficiently as possible to local needs.

Great care must be used in planning hospitals in sparsely settled areas. Questions of maintenance and staff must be answered satisfactorily. We cannot afford, by over-ambitious programs of hospital construction, to set up small local islands of competition within areas already adequately served. Therefore the Federal Works Agency welcomes the review of PWA hospital projects suggested by the Surgeon General in a recent communication, and it welcomes constructive and thorough criticisms of its operations. Only through the closest coöperation can we deal adequately with the problem of the federal-states relationship in public health, and eliminate all possible grounds for controversy among us.

I believe that the more we consult together the better it will be for the people who rely on us to assist in providing an adequate physical plant and such services as WPA is prepared to provide. Any disagreement among the consultants who treat so important a patient as the United States of America must sooner or later be reconciled—and time is of the essence. Our concern as builders is to see that money is not wasted.

With this restatement of an essential principle, I am glad to be able to cite the following achievements under the Federal Works Program.

1. PWA HOSPITAL CONSTRUCTION

In 1938 the President's Interdepartmental Committee, in its report, *The Need for a National Health Program*, estimated that two-thirds of the states had fewer general hospital beds than were indicated by professional standards of adequacy. It is true that many apologists for the status quo have referred to the number of unoccupied hospital beds in any given year. Such references must be considered disingenuous, however, when one remembers that beds in a large proportion of our hospitals are beyond the economic reach of the majority of citizens. From all current studies, it would seem clear to an unprejudiced observer that the need for public hospitals in which beds will not remain unoccupied because of prohibitive rates, is a definite and unavoidable one.

PWA has done more to meet this need than any other agency now in existence. Up to the present time, PWA has provided a total of 121,760 hospital beds at a cost of $377,644,883. This is the equivalent of 5 years'

TABLE 1

Summary of Non-federal Hospital Projects by Type

(As of October 1, 1939)

	Beds		*Estimated Cost*			
	Number	*Per cent*	*Amount*	*Per cent*	*Approximate Average Cost per Bed*	*Number of Projects*
Insane asylums	42,922	39.8	$102,903,731	25.9	$2,397	165
Institutions for feeble-minded	8,914	8.2	19,618,397	4.9	2,201	38
Epileptics	1,818	1.7	5,296,314	1.3	2,913	10
Tuberculosis	13,508	12.5	50,306,715	12.6	3,724	119
General	18,307	17.0	96,256,457	24.2	5,257	250
Charitable homes for aged	6,866	6.4	15,279,629	3.8	2,225	60
All others *	15,514	14.4	107,592,463	27.3	6,935	101
Total	107,849	100.0	$397,253,706	100.0	$3,683	743

* Included are hospitals not falling into above classifications and projects which have hospitals of two or more classifications in one project docket. Included in this figure is $56,496,207 not for direct hospital construction but part of the multiple type hospital projects.

growth under normal conditions. PWA, however, has not yet been able to meet existing hospital requirements because of the fact that from 1929 to 1939 a deficiency in hospital construction amounting to about $550,000,000 had been accumulated.

From 1933 to 1939 PWA accomplished 71 per cent of the total increase in hospital construction. Federal hospitals under this program have been provided for veterans and for men in active service, and a vast increase has been made in medical research stations. PWA financed non-federal hospitals include general hospitals, tuberculosis hospitals, mental hospitals, and homes for the aged and indigent.

For federal hospitals a total of $36,887,384 had been allotted up to March 1, 1939, and 151 hospitals and institutions had been built.

Service and utility buildings for existing hospital plants have also been provided by PWA. There have been hundreds of projects for rebuilding kitchens, boiler plants, power and light plants, nurses' homes, administration buildings, staff quarters, garages, water supply systems, and other utilities.

PWA has also made allotments for construction of medical and dental schools, as well as for clinics, dispensaries, and research centers for educational institutions.

2. PWA SEWAGE DISPOSAL PROJECTS

Eleven per cent of all PWA non-federal work has been devoted to the construction of sewerage systems. About 67 per cent of all new sewage treatment plants built since 1933 have been PWA projects.

During the past few years there has been less progress in the construction of incinerators and other garbage and refuse disposal plants than there has been in the construction of municipal sewage disposal systems. The 41 projects so far undertaken, however, represent the finest plants of their sort in the world.

Mechanization of garbage disposal and sewage treatment has advanced greatly under PWA. There has been a definite increase in the number of complete chemical and mechanical treatment plants using by-products such as sludge for fertilizer and gas for power.

But the need for further building continues to be great. It has been estimated that at present 1¾ billion gallons of sewage a day receive adequate treatment, 1½ billion gallons receive only primary treatment, and 2½ billion gallons receive no treatment.

Of course, not all wastes require full treatment. But every local problem must be carefully considered, and the proper treatment provided. Hundreds of communities now plan to provide

TABLE 2

Non-federal Sewage and Refuse Projects

(As of March 1, 1939)

	Number of Projects	*Estimated Cost*	*Funds Supplied by Applicant*	*Total*	*Loan*	*Grant*
Sewage disposal plants	873	$325,357,874	$122,298,876	$203,058,998	$ 85,405.015	$117,653,983
Sanitary sewers	463	87,614,366	41,533,453	46,080,913	11,335,649	34,745,264
Storm sewers	116	20,576,184	11,022,708	9,553,476	2,049,887	7,503,589
Combined sewers	75	32,759,590	12,537,254	20,222,336	8,196,295	12,026,041
Grand total sewer and water (jointly)	196	23,786,950	6,565,476	17,221,474	8,407,156	8,814,318
Grand total garbage and rubbish disposal	41	10,909,406	4,299,333	6,610,073	2,743,750	3,866,323
Grand total sewage system	1,527	466,308,014	187,392,291	278,915,723	106,986,846	171,928,877

adequate facilities as soon as they can finance their projects.

3. PWA WATER WORKS PROJECTS

The problem of water supply is deeply involved with that of proper sewage treatment and stream pollution control. While Chicago, for example, can draw upon Lake Michigan for its water supply, it has had to reverse the flow of the Chicago River so that its wastes would not be poured into the source of its drinking water. Filters, chemical treatment and purification plants must be employed by many cities to guard their water supplies against pollution from other cities.

More progress has been made in the provision of adequate water supply than in sewage disposal and stream purification, but industry and air-conditioning together are making increased demands upon the supply available.

From 1919 to 1929, municipalities spent an average of $119,000,000 a year for new water works. By 1933, however, the average had fallen to less than $47,000,000. Between 1933 and 1939 new construction rose to an average of $85,000,000 a year. PWA financed projects accounted for about 50 per cent of this total.

There have been 2,372 non-federal water works projects costing $298,869,149, actual construction varying from 37 to 77 per cent of all new non-federal water works construction a year. Communities in every state have undertaken new construction of this type, the number of projects ranging from 158 in Ohio to 3 in Delaware.

PWA has been very successful in detecting high fluorine content in water, and it has brought about the installation of many water softening and iron removal plants. Other plants have provided for chlorination, filtration, and aeration. In connection with PWA water works projects, more than 500 treatment plants of various types have been constructed. PWA water works have furnished a public supply of potable water for the first time to more than two million people.

4. WPA CONSTRUCTION AND SANITATION PROJECTS *

Construction of health facilities by the WPA has been carried on in the same categories as in PWA, with the addition of certain others not open to the PWA method.

An extensive program of hospital building and repair has been conducted, with more than 100 new hospitals built, 1,422 repaired and improved, and 38 provided with additions, up to June 30, 1938. Reports on physical accomplishments for the fiscal year 1938-1939 will be available shortly. It may be interesting to state here that in the 8 month period from July 1, 1938, to March 1, 1939, WPA construction of new buildings of all types averaged over 15 a day. Construction of hospitals averaged about 3 new hospitals per month and 40 hospital buildings repaired or improved.

Community sanitation, malaria control, and mine-sealing activities are carried on in close coöperation with the U. S. Public Health Service, under an agreement which provides for supervision by the Service as well as for the assignment of technical supervisory personnel to the state health departments. WPA funds for this technical supervision were reduced by the Congress from $500,000 in 1938-1939 to $300,000 in 1939-1940. The sum of $300,000, I should note, was set by the House; the Senate raised it to $600,000, but it was cut to $300,000 again in Committee.

The community sanitation projects call for the building of sanitary privies of the concrete slab pit-type in small

* All figures for WPA projects through June 30, 1938, unless otherwise noted.

towns and suburban areas, where sewers cannot be built. The prevention of the spread of filth-borne disease is of course the object of this program. A campaign of education goes along with it, and results are good as long as proper equipment and proper supervision are provided. But this requires an adequate public health staff far above what is now available. Under this program, the owner pays for the materials, which cost from $18 to $30. Supervisory costs per unit average about $.75. Construction according to Service specifications is carried on by WPA workers. Up to the present time, it is estimated by the Service that about 25 per cent of the needed work in this field has been done. Under all three of the Emergency Relief programs—CWA, ERA, and WPA—some 2,140,000 sanitary privies had been built by April 30, 1939. Of this total the WPA had built 1,759,000.

Success of this program in actual numbers of typhoid cases prevented has been reported by many state health officers. In a letter to Colonel F. C. Harrington, Commissioner of the Work Projects Administration, the Surgeon General gave a few statistics that should be of interest. Dr. Parran said:

> In Mississippi in 1932, there were reported 161 deaths and 917 cases of typhoid fever; while in 1937 only 77 deaths and 349 cases were reported. . . . The State Health Officer of Mississippi has stated that cases and deaths from hookworm disease and dysentery have shown a reduction similar to that for typhoid.
>
> In Tennessee in 1932, there were reported 308 deaths and 1,898 cases of typhoid fever; while in 1937, only 148 deaths and 763 cases were reported. More than 175,000 sanitary privies have been constructed in this state.
>
> The records for West Virginia show a reduction of from 1,265 cases and 218 deaths from typhoid fever in 1932, to 350 cases and 78 deaths in 1937.

In a letter to me on last September 13, H. A. Kroeze, Director of Sanitary Engineering for the State of Mississippi, writes as follows:

> As a result of this very material assistance (WPA community sanitation and malaria control) we have been able, in the past 6 years, to accomplish in rural sanitation an amount of work equivalent to 31 years of effort at our normal rate of progress and in malaria control drainage an amount of work equivalent to approximately 45 years of endeavor at our former rate. . . . In 1933 the death rate per 100,000 from malaria was 33.5, whereas in 1938 it was 11.9. A similar condition is found in the death rate of typhoid fever. In 1933 the rate per 100,000 population was 6.5 and in 1935 it was 2.9.

Similar statistics are now available for many other states. L. M. Clarkson, Director of Sanitary Engineering, Georgia Department of Public Health, reports a drop in the typhoid death rate from 8.4 in 1933 to 4.5 in 1937. For malaria the reduction has been from 12.2 in 1933 to 7.5 in 1937.

Dr. A. T. McCormack, State Health Commissioner, Kentucky, submits a very interesting table of typhoid death rates.

KENTUCKY

Year	*Population*	*Total Deaths*	*Death Rate per 100,000*
1928	2,553,000	392	15.3
1929	2,553,000	315	12.3
1930	2,614,589	416	15.8
1931	2,614,589	379	14.1
1932	2,614,589	337	12.9
1933	2,638,000	317	12.0
1934	2,638,000	296	11.2
1935	2,638,000	240	9.1
1936	2,866,000	209	7.3
1937	2,920,000	160	5.5
1938	2,920,000	127	4.6

In a letter to me of September 19, 1939, Dr. McCormack states that typhoid fever and other water-borne diseases have now been almost entirely eliminated in almost every one of Kentucky's 120 counties.

Two programs carried on under the close supervision of the Service are the WPA malaria control and mine-sealing programs.

Since the beginning of the WPA in 1935, malaria control drainage projects

TABLE 3

WPA Construction of Water Supply, Sanitation and Drainage Systems

December, 1939

Type	*Unit of Measurement*	*New Construction*	*Reconstruction or Improvement*
Water mains, aqueducts or distribution lines	Miles	9,646	2,737
	Consumer connections	239,000	344,000
Storage tanks, reservoirs, and cisterns	Number	2,089	539
	Gallons of capacity	1,475,043	20,940,104
Wells	Number	3,182	
Treatment plants:			
Sewage (excl. cesspools and septic tanks)	Number	549	313
Water	Number	124	108
Garbage incinerators	Number	74	42
Pumping stations	Number	646	219
Storm and sanitary sewers	Miles	15,191	3,050
	Service connections	352,000	33,000
Manholes and catch basins	Number	472,000	282,000
Drainage (other than roadside and mosquito eradication)	Miles of ditch	3,697	15,562
	Miles of pipe	1,613	907
	Acres drained	3,412,000	10,850,000

have been conducted in an average of 250 counties in 16 states. Up to June 30, 1939, 15,654 miles of ditches had been dug and cleaned, resulting in the drainage of 2,981,000 acres of actual water surface, thereby affording protection to some 7,064,425 people who live within mosquito range of the projects.

Since malaria appears to have a 6 year cycle, sufficient time has not elapsed for definite statistics on the results of the program, but the Surgeon General has already pointed out that through the WPA drainage program our control of this disease has been advanced 20 years beyond the point it would otherwise have reached.

Control of acid pollution of streams, another important public health measure, is maintained through WPA projects for the sealing of abandoned coal mines. The Public Health Service furnishes consultant service on these projects to the WPA and the state health departments through trained technical personnel stationed in four regional offices.

Before the beginning of the WPA program, it was estimated that 2,450,000 tons of acid (on the basis of concentrated sulfuric acid) were discharged every year into the Ohio River and its tributaries. Some 1,024,000 tons were estimated as originating in abandoned mines. Over 500,000 tons of acid have already been sealed off in the Ohio River basin, over 8,000 tons in Maryland, and over 12,000 tons in Alabama. Mine-sealing projects are now in operation in Maryland, West Virginia, Ohio, Indiana, Illinois, Tennessee, Alabama, Pennsylvania, and Kentucky.

Statistics on WPA construction of water mains, reservoirs, treatment plants, etc., are available up to the close of the fiscal year in June 30, 1938.

5. WPA PROFESSIONAL AND SERVICE PROJECTS IN THE FIELD OF HEALTH

Doctors, dentists, nurses, clerical personnel, and skilled and unskilled workers of certain types have been made available by the WPA under a very broad program of supplementing and extending work done by existing health agencies. The main categories under which this work is carried on are:

a. Research and surveys
b. Clerical and technical assistance to health departments
c. Clerical and technical assistance to hospitals and medical schools and institutes
d. Maintenance of clinics and health centers, and assistance to others
e. Provision of visiting nurses
f. Provision of housekeeping aides
g. Nursery school and parent education program
h. Hot school lunch program
i. Special projects

Of course, it is impossible in this brief space to give more than a bare outline of these services. I shall content myself with some statistics and with brief mention of a few outstanding projects.

One of the most important of these was the National Health Survey, administered by the Public Health Service, which was the most far-reaching inventory of the nation's health ever drawn. Some 5,000 trained enumerators, drawn from WPA rolls, canvassed nearly 800,000 families in 19 states and 84 cities. The data they gathered cover the entire field of acute and chronic disabling illness and the treatment received by all groups of the urban population of the United States. Reports issued by the Service cover scores of separate studies made possible by the survey. In the light of the present discussion of a national health plan the importance of this survey can hardly be overestimated. Incidentally, Public Health Service officials have assured us of the efficiency of WPA white-collar workers on this and other similar projects.

As far as assistance to health departments goes, one can only advise those who are not yet aware of the scope of such work to visit their city health departments and ask their guide to point out to them the people in the various bureaus who are paid out of WPA funds. One would then need to make an extended visit to projects in the field. Only then would an adequate picture be gained of the extent to which WPA assists our city health departments. Many good examples are provided in the December 12, 1938, report of the Commissioner of Health of New York City—as in tables like Table 4.

TABLE 4

Classification of the Personnel of the New York City Bureau of School Hygiene, 1937

Title	*Civil Service*	*WPA*	*ERB*
Acting Director (Physician)	1	..	..
Medical Supervisors	12	..	..
School Physicians	100	77	..
Ophthalmologists	14	..	..
Cardiologists	2	..	..
Chief of Dental Division	1	..	..
Dental Supervisors	6	..	..
Dentists	37	98	21
Dental Hygienists	48	46	17
Stenographers	2	1	..
Clerks	1	9	..
Grand Totals	224	231	38

A similar examination of our city hospitals would show WPA nurses, laboratory assistants, attendants, and unskilled workers performing their tasks within the existing structure of the hospital administration. Health departments, medical schools, and institutes have been able to carry on many laboratory and research studies through WPA assistance; typical examples are the Michigan State Department of Health projects for isolation of whooping cough germ and development of serum, and the New York City Pertussis Clinic studies. Dr. Merrill Moore's studies of alcoholism at the Haymarket Relief Center in Boston are an especially interesting example of important research work done through WPA assistance.

Clinics maintained or assisted by WPA are of all types. Maternal and child health clinics, tuberculosis prevention clinics, venereal disease clinics like the excellent ones in Chicago and New York City, are some of the most

interesting. Dental clinics provide a very important service to people who would otherwise not receive needed treatment. Up to June 30, 1938, more than 3,500,000 persons had been treated in such clinics. Nurses had been provided at 893,000 immunizations, and 4,737,000 home nursing visits had been made.

A beginning has also been made in one of the most sadly neglected fields of all—that of providing housekeeping workers in poor homes where illness or childbirth has disabled the mother. WPA housekeeping aide centers have been established in most large cities, where women are trained to cook, clean, and care for children. These women had made over 7,000,000 visits up to June 30, 1938.

The nursery school program has brought proper care of young children into many thousands of poor homes. In a typical year, this program provides some 1,500 nursery schools for 40,000 children between the ages of 3 and 5.

The WPA school lunch program has met the problem of undernourishment among underprivileged children in the most direct way by providing a hot lunch to them on every school day. Up to December 31, 1939, 386,197,000 such lunches had been served.

Many special projects, initiated because of local need and local public spirit, further serve to expand the work which is being done under the WPA health program. A splendid example is the Tuberculosis Preventorium Project in Amarillo, Tex., which has given local initiative a chance to show what it can do. Civic clubs, business firms, churches and Sunday school classes donated money to carry on this project. A local club donated money for the building. Brick masons, carpenters, plasterers, painters, and plumbers donated labor. Merchants and farmers contributed.

Local effort and good will can do much when aroused; and when it works in coöperation with the Department of Health and with federal agencies like the WPA and the PWA, it is great cause for pride to see what can be done.

Of course, it is easy to avoid responsibility by pointing to work that has already been done. As Dr. J. W. Mountin of the Public Health Service once said:

> It is always restful, in any hard climb, to look backward and praise ourselves for our progress. But doing this is like comparing a gravel road with the muddy cow-track upon which our ancestors travelled, in order to demonstrate to ourselves that we can get along without a concrete highway. But we cannot get along without the finest highway to health that it is possible for us to build. What we need is an awakening of our national conscience for the health of all our people. Nothing less than such a national awakening will serve to meet the situation.

I am encouraged to believe that we shall have a new birth of coöperation on a large scale among private and public agencies devoted to the problem of achieving here in the United States the highest health standards in the world. The President's reorganization plan is one step in that direction centralizing, as it does, much of the national interest in these programs in the Federal Security Agency, with facilities competent for technical research and standards, and in the Federal Works Agency with skill, organization and experience in the field of construction.

Nutrition and Health in Pasadena*

HENRY BORSOOK, PH.D., M.B., AND
WILTON L. HALVERSON, M.D., DR.P.H., F.A.P.H.A.

Professor of Biochemistry, California Institute of Technology, Pasadena, Calif.; and Health Officer, Pasadena, Calif.

THE health officer is interested in all factors which are related to the health status of the community. He desires to apply the factual information regarding food requirements and food composition which has in recent years been supplied by laboratory workers.

The first step in the application of this knowledge to human needs is to ascertain the actual diet of the individuals composing different communities. The quality of the dietary may then be compared with the recommended standards and with the health of these individuals. From such comparisons the problem in each community can be definitely ascertained and where called for appropriate remedial measures may be intelligently undertaken.

Pasadena, 9 miles from Los Angeles, has a population of approximately 85,000. It has no large industries, but is a living place for many individuals employed in the City of Los Angeles, and others retired from various parts of the country. The percentage of families on relief is approximately 11.5, the same as the average for that of Los Angeles County.

The nutrition survey was carried out between May and August, 1938, under the auspices of the California Institute of Technology, the Health Section of the Council of Social Agencies, and the Health Department. The diet of 50 families was ascertained by the inventory method. These families were chosen at random from those on relief, to those with incomes of $3,000 per year. Most of the families were in the $1,200 to $1,800 income group. Ten were on total or partial relief. The group was composed of 151 adults and 72 children below the age of 14.

The diet data were analyzed into the following items: calories, protein, fat, carbohydrates, calcium, phosphorous, iron, vitamin A, vitamin B_1 and vitamin C. The nutritional data were obtained by public health nurses from the Health Department, the Visiting Nurse Association, and other members of the Health Section of the Council of Social Agencies. Each family was visited every day for 2 weeks. An inventory was made of all the food on hand at the beginning of the study. For 2 weeks the amount purchased and the amount of actual waste were recorded daily and at the end an inventory was made of the food remaining. All items, including the waste, were weighed or measured.

The clinical examination, carried out approximately one year after the study was started, was made by one of us *

* Read before the Food and Nutrition Section of the American Public Health Association at the Sixty-eighth Annual Meeting in Pittsburgh, Pa., October 20, 1939.

* Wilton L. Halverson, M.D.

with the exception of teeth and gums which was done by Herbert Brenner, D.D.S.

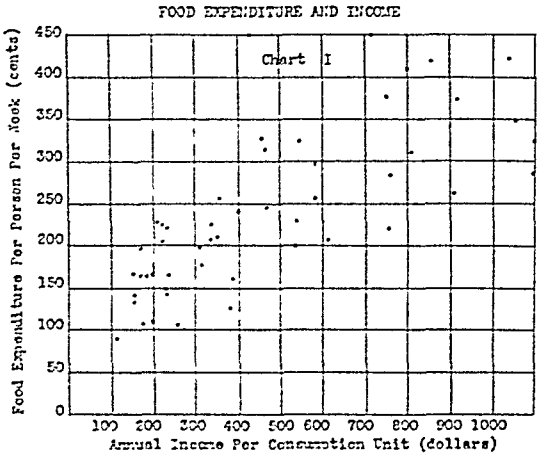
A history was taken to secure data relative to present and past incapacities and diseases. A routine physical check was made with special attention to those conditions which might indicate possible nutritional deficiencies. This was supplemented by hemoglobin estimation and, where the hemoglobin was below 13 grams per 100 cc. of blood, by the red cell count.

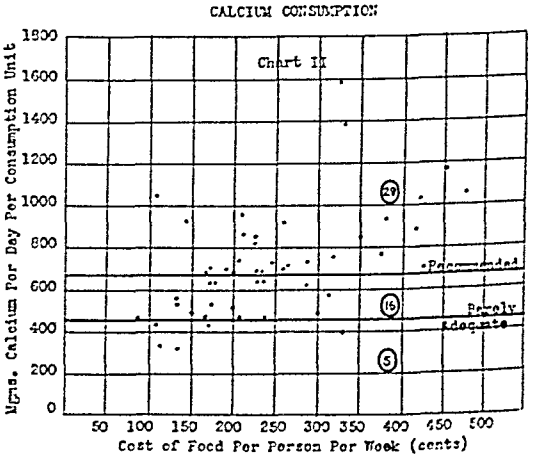
ANALYSIS OF THE DIETARY DATA

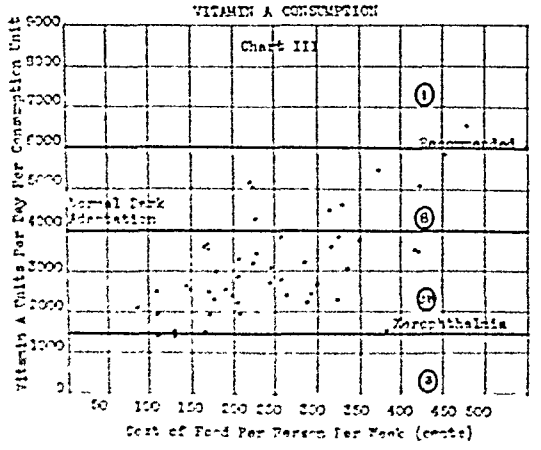
Standard tables were used, modified according to the latest information in the literature, especially in regard to the vitamin and iron content. The figures for physiologically available calcium and iron were used instead of the total content, where these data were available. In the case of vitamin A, two Sherman units were taken as equal to one International Unit.[1]

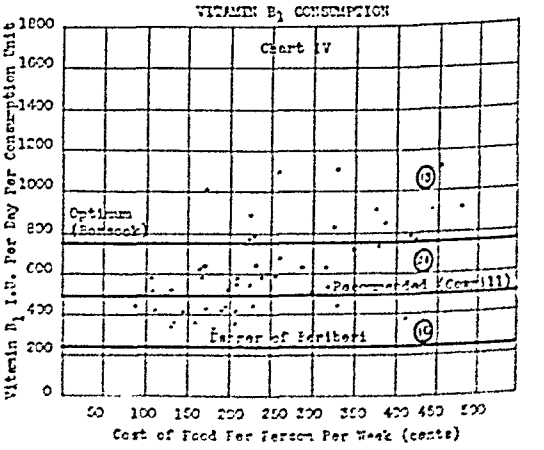
There are serious discrepancies between the newer figures on the vitamin B_1 content of common foods and the older ones. Wherever such discrepancies existed we have used the latest reliable figures, especially those of Baker and Wright.[2, 3] The vitamin B_1 content of milk and meat have been rechecked in our laboratory by rat growth and phycomyces growth methods. Two Sherman units were taken as equal to one International Unit.

We have followed Stiebeling and Phipard [4] in the choice of the food unit requirement, and also taken their estimate of the requirements of different ages and sex. The unit in every case









is the requirement of an adult male engaged in moderate work. Women and children are considered as some fraction of this unit greater or less than unity.

FOOD COSTS

Chart 1 shows the relation between the cost of food and the annual income. The smallest amount was $.89 a week for each person, and the largest $4.80. Most of those spending less than $2.08 a week for each person obtained an inadequate diet as measured by present nutritional standards. On the other hand, the diet was adequate in nearly all families spending more than this amount. The dividing line was remarkably sharp. This does not mean that $2.08 was necessary in order to secure an adequate diet. A few families with some special knowledge of nutrition and with the will to apply it did obtain a first-class diet for as low as $1.50 a week for each person.

Stiebeling and Phipard [4] found that in 1935 Pacific Coast families with average intelligence required a weekly expenditure of $2.25 per person per week which is very near the figure shown by this study.

CALORIES

More families with ample funds for food had an ample caloric intake than those on restricted budgets. Twenty-two families had less than the recommended intake of 3,000 calories per consumption unit per day, and 14 had less than 2,700 calories, which is 10 per cent below the standard.

Height and weight checks showed as large a per cent of underweight in families having an adequate caloric intake as those below the recommended standard.

It is probable that caloric intake standards are higher than necessary or at least apply only when there is need of excessive heat production.

PROTEIN

None of the 50 families obtained less than the daily consumption unit minimum recommended by Sherman (45 gm.). Twelve families obtained less than 66 gm., which is the recommended amount. In view of the uncertainty regarding the optimum protein requirement of human beings it is probable that even those obtaining less than 66 gm. of protein daily were nevertheless obtaining adequate amounts. In practically every case one-half or more was of animal origin. Since authorities recommend as a *minimum* only one-third of total protein to be of animal origin, we may conclude that the protein intake in all of these families was adequate with respect to both quality and quantity.

CARBOHYDRATE AND FAT

In all cases, except two, 25 per cent or more of the total calories was provided by fat, and 35 of the 50 families obtained approximately one-third of their calories from fat. The balance between carbohydrate and fat in the diet may be considered normal and the amount of each adequate.

CALCIUM

Chart II shows that of the 50 families, 5 were obtaining less than 450 mg. per consumption unit daily. These families, therefore, were probably in negative calcium balance, that is, they were probably excreting more calcium than they were eating. Sixteen families were obtaining between 660 and 450 mg. daily per consumption unit.

According to modern nutritional standards, therefore, the calcium intake of these 21 families was inadequate.

IRON

Eight mg. of iron daily is the minimum requirement for iron balance, according to Sherman. Authorities differ as to the optimum iron requirement.

Amounts varying from 10 to 15 mg. are recommended. In our series of 50 families there was only one obtaining less than 8 and one between 8 and 10 mg. per consumption unit. The iron intake, therefore, may be considered as generally adequate. One of the important sources of iron was leafy vegetables of which relatively large amounts were consumed.

VITAMIN A

In computing the vitamin A intake, we have followed Leila Booher,[5] taking the vegetable vitamin A (beta carotene) as being only 60 per cent as available as that of animal origin. Chart III shows that 3 families were obtaining less than 1,500 I.U. per consumption unit daily. There was in these a definite danger of xerophthalmia. An additional 38 of the 50 families obtained less than 4,000 I.U. daily. It is probable, according to Booher,[5] therefore, that most of the members of this group, if tested, would have shown less than the normal rate of retinal dark adaptation. Only 8 families obtained between 4,000 and 6,000 I.U. of vitamin A per consumption unit daily, and only one family more than 6,000 units daily. Yet, 6,000 I.U. daily is the amount recommended by nutritional workers.

VITAMIN B_1 (THIAMIN)

Chart IV shows that only two families in our series obtained less than 350 I.U. of vitamin B_1 daily per consumption unit. They received 340. Therefore, the study showed no real danger of beriberi. On the other hand, there were 14 families in addition who received less than 500 I.U. per consumption unit daily. Approximately one-third were obtaining less than the generally recommended amount.

This figure of 500 I.U. daily is by no means the optimum amount for adults. From studies which one of us [6] carried out it is indicated that 750 I.U. daily is required by most adults for good gastrointestinal function. In our series there were only 13 families who received 750 units per consumption unit or more daily.

In view of the fact that such physiological stresses as pregnancy, fever, hyperthyroidism and strenuous work, call for increased vitamin B_1 intake, the 16 families who obtained less than 500 I.U. per consumption unit daily may be considered as subsisting on a somewhat unsafe level of B_1 intake. It is interesting that among the poorer families an adequate amount of B_1 was obtained only by those who consumed in fairly large quantities at least two of the following items: peanut butter, a cereal consisting of wheat middlings with added wheat germ (which has become widely used in southern California), whole wheat bread.

There are four other known components of the B complex aside from B_1, and there are probably others. The human requirement of these other components is not so well established as that of vitamin B_1. Nevertheless, the whole B complex is required. In a mixed diet, however, the vitamin B_1 content may be taken as an index of the amount of the whole B complex because the distribution of other members of the B complex is in most cases similar to that of B_1. For this reason, natural food sources rather than single purified components would best be used except as prescribed by physicians in specified clinical conditions. Purified vitamins should not be used in place of natural foods.

VITAMIN C

Every family in the group studied obtained 70 mg. or more (the optimum recommended amount) of ascorbic acid daily per consumption unit. This high consumption of vitamin C which is unusual in most urban areas in the United States results from the easy

availability of leafy vegetables as well as citrus fruits. In 74 per cent of the families studied the former contributed more vitamin C than citrus fruits.

A summary of the nutritional findings of the 50 families is noted in Table 1. This shows that 12 families were deficient in three or more essential items, while 18 enjoyed an adequate diet in every respect.

TABLE 1

Nutritional Deficiencies

Number of Deficiencies	*Families*
0	18
1	14
2	6
3	7
4	3
5	2
	50

TABLE 2

Consumption of Foodstuffs per Week per Consumption Unit

	Average for Fifty Families
Bread, cake, pastry, rolls, flour (as flour)	50.3 oz.
Butter	6.3 oz.
Cheese	2.6 oz.
Eggs	5.0
Fresh milk	7.35 pt.
Canned milk (calculated equivalents of fresh)	0.56 pt.
Meat	31.20 oz.
Fish	4.40 oz.
Potatoes	28.10 oz.
Vegetables (other than potatoes)	60.60 oz.
Fruit	47.70 oz.
Sugar	19.90 oz.

Table 2 shows the average weekly consumption of the different foodstuffs per consumption unit in the group studied. The milk consumption was somewhat above the average for the country as a whole. Fruit and fresh vegetable consumption was much higher than that of the country as a whole, which accounts for the large intake of vitamin C. Even with this large consumption of fruit and vegetables, most families did not obtain enough vitamin A, and about one-third of the families did not obtain adequate amounts of vitamin B. These figures indicate the difficulty of obtaining the necessary amounts of vitamins even on the so-called good diet and they emphasize the need of education of the public on the quantitative aspects of nutrition.

CLINICAL FINDINGS

Although the clinical examinations were made about one year after the study was instituted, it is probable that they represent a fairly accurate picture of the physical status of the families at the time of the study, since no changes were instituted in the dietaries or scale of living. Eighty individuals in 25 families were checked. There were 56 below the age of 18. No serious illness was found except one case of rheumatic heart disease with an advanced mitral lesion. Height and weight variations were not remarkable and there were no more underweight children in the families having low per person food expenditures than in the group as a whole. In only 6 cases were there badly infected tonsils. Only one child showed impetiginous skin lesions and no other skin infections were found. Two children showed evidence of early rickets of a mild nature by the presence of a rachitic rosary. In practically every instance the tissue turgor was good and the skin was in good condition. Dry, lusterless hair was rarely encountered. Hemoglobin estimations indicated that there was no evidence of anemia. This was in line with iron consumption. The lowest value, 11 gm., was found in an adult with known secondary anemia.

DENTAL DEFECTS

Only individuals under the age of 18 are included in the dental check. Of the 56 in this group, 17 showed no dental caries, whatever. There is no striking correlation between freedom from dental caries and high calcium intake. Neither is there a correlation between freedom from dental caries and high expenditure for food.

The findings of the British Medical

Research Council[7] indicate that the condition of the teeth is almost entirely dependent on the nutrition at the time of the development of the teeth and not on the diet following tooth development. Furthermore, the most important single nutritional factor is vitamin D, which has not been determined in this study. These considerations limit the conclusions that can be drawn from our present dental data.

CONCLUSIONS

There can be no question of the relation between diet and health where the diet is so poor as to result in well defined clinical deficiency disease. Students of nutrition, however, emphasize that good health is more than the absence of frank clinical disease and that an optimum diet is one of the essential conditions of good health. Our survey revealed a significantly large number of families subsisting on inadequate amounts of calcium, vitamin A and B_1. We might, therefore, have expected some evidence of sub-optimal health among these families. This was not found by any of the measures employed.

We do not wish to be interpreted as concluding that individuals receiving a sub-optimal diet according to present standards are not below par. We do wish to emphasize that this point remains to be clarified. To some extent this has already been done in the study referred to above[6] on the relation between vitamin B intake and chronic gastrointestinal malfunction. Is there any other evidence of ill health resulting from a sub-optimal diet? The scope of the clinical examinations in this study did not yield any such evidence.

We feel that a much more thorough and extensive analysis of the health of children and adults must be carried out over a number of years to determine how sub-optimal diet affects health. It is probable also that more refined measures of the below-par state than are now available will be necessary.

It should be emphasized that excepting for heavily depressed areas in this country we are not dealing with clinical nutrition deficiency disease to any significant degree, but in most urban communities in the United States with subclinical effects of a sub-optimal diet such as we have encountered in this study.

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Methods of Inoculating the Guinea Pig Through Various Channels*

RALPH W. MOHRI

Captain, Veterinary Corps, United States Army, Washington, D. C.

THE discussion has been limited to those methods most frequently used in the laboratory. No attempt has been made to suggest the preferred routes of inoculation for the various types of microörganisms, nor to describe the resultant pathology.

The technician who is not well acquainted with the anatomy of the guinea pig should dissect several cadavers in order to identify and locate the various organs.

Standardization of methods may be considered worth while by some to avoid possible criticism based on difference in the manner of inoculation, but different methods often produce the same result, as illustrated in surgery, where the surgeon may select one of several methods to perform the same operation.

The technics for the following methods are described, preceded by a section on asepsis, anesthesia and restraint:

1. Intracutaneous
2. Cutaneous
3. Subcutaneous
4. Intramuscular
5. Bloodstream inoculation
 a. Intravenous
 b. Intra-arterial
 c. Intracardial
6. Intracerebral
7. Intraspinal
8. Intraperitoneal
9. Intranasal
10. Intrapleural
11. Into the lungs
12. Intratracheal
13. Oral administration
14. Abdominal organs

ASEPSIS

All inoculations which require penetration of the skin should be made under aseptic precautions. Operators too frequently fail to recognize the importance of this fact with a subsequent miscarriage in their results as well as a loss in time and possible waste of animals.

The body hair at the site of injection or incision should be clipped, shaved, and disinfected. The shaved area is cleansed of surface scales and débris with a solution of 5 per cent acetone in 70 per cent ethyl alcohol, allowed to dry, and then painted with tincture of iodine, applied with a sterile swab, beginning in the center of the area, and with a circular motion working toward the periphery. The swab should not again touch the center. The iodine is allowed to act for at least 5 minutes. The area is disinfected upon completing the inoculation.

The sterilization of needles, syringes, surgical instruments, sponges, sutures, and other equipment is essential. For

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abdominal operations sterile rubber gloves should be worn. If possible, the operating chamber is wetted down to prevent dust from contaminating the wound. Apparatus accidentally contaminated during the operation must be discarded.

These directions will not be repeated in discussing the various methods, but are implied in all cases where applicable.

RESTRAINT

Though unusual, guinea pigs sometimes bite, especially when they are so restrained as to cause severe struggling. Caution must be observed in their their handling. To hold the guinea pig a pair of large pressure forceps such as are employed in small animal surgery to grasp the tongue are suitable. The grasping ends are fitted with serrated rubber pads which prevent slipping and pain. The guinea pig is grasped by the loose skin of the back over the shoulder region and may be maneuvered into any position desired.

For inoculations which require immobilization, the animal is fixed on a shallow metal tray or board in the dorsal or ventral position. A standard metal dissecting tray, 12 x 18 inches, serves the purpose well. The animal is placed on the tray and its legs fastened to the studs on each of the four corners with stout cord. For the ventral position, a piece of tape passed over its back and tied to either side of the tray will assist in reducing movement.

Special methods of restraint are described under the appropriate operations.

ANESTHESIA

Anesthesia is indicated whenever the injection is painful such as cardiac puncture, intraspinal and intracerebral inoculation. Local anesthesia is seldom used because of the ease with which a general anesthetic may be administered.

Ether inhalation is usually the most satisfactory method. Chloroform may be employed but its margin of safety is restricted. Intraperitoneal injections of the barbiturates such as nembutal and halatal while satisfactory produce longer unconsciousness than generally necessary. Their use is desirable for lengthy operations, especially when the technician is unassisted.

A suitable ether inhaler may be fashioned from an ordinary tin or cardboard mailing tube, large enough easily to accommodate the head and neck of the guinea pig. The closed end is perforated a number of times with a small nail. A pledget of cotton is lightly tamped against the perforations from the inside as an absorbent for the ether. The operator should assure himself that air can readily enter through the cotton, as otherwise the guinea pig will die from suffocation.

All preparatory procedures are completed before giving the anesthetic in order to limit the period of anesthesia. Careful observation will reduce fatalities to a minimum.

Eight to 10 cc. of ether for anesthesia are poured on the cotton in the inhaler. The guinea pig is placed on a table in the ventral position, grasped with the left hand around the body, and the inhaler placed over its head with the right hand. The animal should not be held so tightly as to interfere with the respiration. The duration of the first stage (excitement) varies from 20 to 40 seconds, succeeded by the second stage, anesthesia. As soon as the animal has ceased to struggle, lift it from the table and continue the anesthetic holding it in a dorsal position in the palm of the left hand with head slightly lowered, which permits better observation of the respiration.

Anesthesia is complete with the disappearance of the corneal reflex, determined by lightly touching the cornea with the tip of the finger and observing that the eyelids fail to twitch and the pupil has contracted.

An excessive amount of ether usually causes the guinea pig to twist its head and neck to one side followed by twitching of the hind legs as if it were attempting to scratch its ears, or it may simply exhibit a violent shaking of its head. The pupil will suddenly dilate. If this should occur the ether is immediately withdrawn, the animal grasped by its hind legs and slowly swung to and fro in a downward semicircle. If respiration ceases, artificial respiration is applied by rhythmically compressing the sides of the thorax with the thumb and forefinger. A pledget of cotton saturated with aromatic spirits of ammonia is placed near the nostrils.

It is a good policy to permit an intoxicated animal to recover completely and to select another. If this is impossible, at least give the pig a 30 minute respite before again attempting to administer the anesthetic.

The anesthesia will usually last long enough for most inoculation methods, but may be prolonged by occasional whiffs of ether.

After the animal regains consciousness, place in a cage, keep warm and free from drafts, otherwise, fatal pneumonias may result.

METHODS OF INOCULATION

1. *Intracutaneous*—Intracutaneous inoculations may be made in almost any region of the body but the skin of the abdomen is more adaptable. Immobilize the guinea pig in the dorsal position, clip, shave, and disinfect an area 1″ square in the middle of the abdomen. Use a small syringe with a 26 gauge, ¾″ hypodermic needle. Insert the needle ½″ beneath the epidermal layer with the beveled edge of the point uppermost, holding a fold of the skin between the thumb and forefinger of the left hand. If the needle is in proper position, its outline will be distinctly seen beneath the epidermis. The inoculum is injected as the needle is slowly withdrawn forming a bleb. Just before complete withdrawal, the injection is stopped, and the puncture sharply pinched with the fingers.

2. *Cutaneous*—The site selected is on the dorsal surface of the shoulder, where it is difficult for the pig to bite or scratch itself. Clip and shave, but antiseptics are contraindicated because of possible interference with the inoculation. Stretch and scarify with a sharp scalpel or razor blade. Remove excessive blood or serum, spread the inoculum over the area and rub into the abrasions with a glass rod. Depending upon the nature of the inoculum, the surface may or may not be covered with gauze bandage.

3. *Subcutaneous*—The areas most adaptable are those over the right and left lateral surfaces of the thoracic cavity.

Just posterior to the elbow, the skin is picked up between the thumb and forefinger and drawn away from the body. The needle is inserted into the pocket formed, the inoculum is slowly injected, the needle quickly withdrawn, and the entrance point pinched to prevent leakage.

It is unwise to inject more than 2 cc. at one point as absorption is retarded and abscess from pressure necrosis may occur. The area is gently massaged to distribute the inoculum. If necessary the opposite side may be utilized.

Material to be inoculated should approximate the temperature of the body.

4. *Intramuscular*—The inner muscles of the thighs are selected due to their size.

The thigh is grasped with the thumb and forefinger and the muscles rotated to the inside. A 20 gauge, 1″ hypodermic needle is large enough unless the inoculum is a particularly heavy tissue suspension. The needle is inserted obliquely through the skin and

into the muscle for ½", and the inoculum deposited as the needle is slowly withdrawn. Sudden pressure on the plunger must be avoided to prevent rupturing the fascial coverings of the muscle. If it is necessary to inject more than 1 cc., the opposite thigh should be used.

5. *Bloodstream*—Due to the lack of adequate superficial vessels, this inoculation is rather difficult unless made directly into the heart. Intracardial injection is not complicated, and with a little practice proficiency may be readily attained. If the inoculation must be made into a vein or artery, the right jugular and carotid are the vessels of choice, since those on the left lie in intimate contact with the esophagus. The exposure and isolation of the jugular vein or carotid artery are quite simple, but due to their small size and fragility care must be exercised in injecting them to prevent their rupture.

a. *Intravenous*—The guinea pig is fixed in dorsal position with the head and neck fully extended by a small cord or copper wire looped around the upper incisor teeth and fastened to a stud on the operating tray. Avoid flattening the nostrils against the tray, thereby suffocating the animal. General anesthesia is required.

The right external jugular vein lies beneath a line extending from a point midway between the point of the shoulder and the sternum, to the angle of the jaw. The skin should be incised longitudinally for 1" just medial to this line. Forceps are attached to the skin flaps and laid over to reveal the underlying structures. The cellular tissues should be dissected with a grooved director, exposing the jugular vein, which is isolated by placing a probe beneath it. Use a 26 gauge, 1" curved shank hypodermic needle. The point should be sharp and free from "fish hooks" which tear the wall of the vein as the needle is extracted. The injection is made in the direction of the flow of the blood.

Allow the needle to remain in the vein for several seconds until sure that the inoculum has been carried away with the bloodstream, then withdraw quickly and close the skin incision with interrupted silk sutures. If irritant antiseptics come in contact with the vein or its surrounding tissues, severe phlebitis may result.

b. *Intra-Arterial*—The guinea pig is prepared as for the intravenous inoculation.

The right carotid artery lies adjacent to the right lateral surface of the trachea in the middle third of the neck region. It is not seen when the jugular vein is exposed because a strip of muscle is interposed between the two. It is in a fibrous sheath with the internal jugular vein, the vagus and sympathetic nerves.

A longitudinal incision is made just to the right of the trachea and the skin flaps held aside with forceps. The aponeurosis connecting the two sterno-mastoid muscles which overlie the artery are carefully divided with a grooved director, to prevent injury to the artery and nerves. The cellular tissue along the trachea is bluntly dissected, the right sterno-mastoid muscle pulled aside, and the sheath containing the artery will be revealed. The sheath is carefully opened and the artery isolated by placing a probe beneath it.

The injection is made with the same type and caliber hypodermic needle as for the intravenous operation; however, the insertion is made in the direction of the head instead of the heart, and the bloodstream permitted to carry away the inoculum before the needle is withdrawn. The skin incision is closed with interrupted silk sutures.

c. *Intracardial*—This is the preferred method for bloodstream inoculation because of the ease with which it may be done and the elimination of skin in-

cision. The technic is identical with that for bleeding the guinea pig for complement except that an injection is made.

The animal is fixed in the dorsal position, a small area over the left side of the thorax is clipped, shaved, and disinfected. A 19 gauge, 1½" hypodermic needle is used. General anesthesia is necessary.

The site for insertion of the needle is the point in the left chest wall where the heart beat is most strongly felt, usually between the 3rd and 4th ribs. The apex is brought further to the left side by pressing slightly inward on the right ribs. The needle is inserted downward, slanting somewhat toward the middle line for approximately ½", which should place it in the ventricle. The needle is held between the thumb and middle finger of the right hand, the forefinger pushing downward on the hub. Entrance is shown by a flow of blood from the needle. The loaded syringe is attached, the inoculum injected, and the needle quickly withdrawn.

6. *Intracerebral*—The site for injection into the cerebrum is found by drawing an imaginary line from each ear to the opposite eye and noting the intersection of the lines. The exact location for puncture of the bony plate is a point ⅛" above the intersection and 3/16" to the right or left of the median line. At this point the cerebrum is at its greatest depth, and by going slightly to one side of the median line, the longitudinal fissure is avoided. The pig's scalp should be clipped, shaved and disinfected. General anesthesia is necessary.

Place the animal on a table grasping it with the left hand so that the palm is resting on its back and with the thumb and forefinger steady its head. A quarter inch incision through the skin and subcutaneous tissue is made parallel to the median line and to one side of the point selected for puncturing the skull, so that when the injection has been completed, the skin will move over and cover the trephine opening. Hemorrhage from the incision must be controlled before trephining.

An excellent trephine may be made from an awl by filing the end into a sharp, three-sided point. A blood lancet with a screw guarded stab is also suitable. Place on the selected point of puncture, apply slight pressure, and rotate the trephine between the fingers. Just before the bone is penetrated, a slight "give" will be felt, an indication to proceed cautiously to avoid injuring the meninges. When the puncture is complete the dura mater will be seen. A 25 gauge, ½" needle attached to a syringe is inserted vertically through the opening and into the brain tissue for ¼". The injection must be made slowly with a minimum of pressure on the plunger. From 0.1 to 0.2 cc. may be injected without appreciable damage to the brain tissue. The needle is withdrawn and the skin allowed to resume its normal position. Silk sutures may be used, but, as a rule, pinching the lips of the wound together and covering it with collodion will suffice.

Some operators prefer a small electric drill with a dental burr as a trephine, but there is more danger that the meninges and brain may be damaged.

7. *Intraspinal*—The intraspinal inoculation is not difficult provided the operator has acquainted himself with the regional anatomy by dissection of cadavers. The injection is made by puncture between the laminae of the last two lumbar vertebrae. The cauda equina is found in this section of the canal.

An area 2" long and 1" wide over the lumbo-sacral region, is clipped, shaved, and disinfected. General anesthesia is necessary.

Grasp the pig by its hind legs with

the left hand, permitting the body to hang over the knuckles. This position produces a maximum separation between the spinous processes of the vertebrae. Locate the points of the hips with the thumb and forefinger of the right hand, bring them together slightly in the rear of the hip line to determine the sacro-iliac joint. Using the forefinger alone, the location of the spinous process of the first sacral vertebra is established. The forefinger is then moved forward along the vertebral column where it will first encounter the depression at the lumbo-sacral articulation and next the tip of the spinous process of the last lumbar vertebra. With the finger nail, the space between the last two lumbar vertebrae is marked in the skin. It is essential to remember that the spinous processes of these vertebrae extend upward and forward at a 45° angle.

A 24 gauge, 1″ hypodermic needle is used. The point is inserted vertically under the skin at the mark indented with the finger nail. By carefully manipulating the point, the limits of the spinous process of the last lumbar vertebra may be outlined by the needle, which is then passed downward and backward at an angle of 45° along the anterior border of this process until it penetrates the small space between the articular processes of the last two lumbar vertebrae and enters the spinal canal. As the needle penetrates the canal and touches the cauda equina, the operator will note a sudden twitch of the guinea pig's hind legs. After a few drops of spinal fluid have been permitted to flow from the needle, showing that it is in proper position, the syringe is attached and the inoculum injected. Not more than 0.5 cc. should be inoculated into the spinal canal of the average guinea pig weighing 500 gm.

8. *Intraperitoneal*—The preferred site is a point 1″ anterior to either of the mammary glands and midway between the gland and the median line. The pig should be fixed on a tray in dorsal position or held in this position by an assistant. An area 1″ square is clipped, shaved, and disinfected. The injection is made with a 19 gauge, 1½″ hypodermic needle.

The skin and abdominal muscles are picked up between the thumb and forefinger of the left hand, the needle inserted ½″ through the base of this fold into the peritoneal cavity, and the injection made. As the needle is withdrawn the puncture is pinched to prevent leakage. By lifting the skin and muscles the needle enters parallel to the long axis of the body and penetration of the abdominal organs is avoided.

9. *Intranasal*—Put pig upright in a mailing tube with the head and neck exposed. The operator can control the animal with one hand while instilling material into the nostrils with the other. The inoculum should be fluid and sprayed into the nasal passages with a small atomizer which can be fitted flush against the nares. The opposite nostril is closed by pressing it against the nasal septum.

10. *Intrapleural*—The major problem here is to inject the pleural cavity without penetrating the lung.

Fix pig in dorsal position. A small area over the right side of the thorax, which will include the 5th intercostal space, is clipped, shaved, and disinfected. General anesthesia is necessary.

The skin and subcutaneous tissue is incised at the sternum and continuing along the 5th intercostal space for ¾″. The injection is made with a blunt pointed, 20 gauge hypodermic needle which is perforated laterally, inserted obliquely through the intercostal muscles and parietal pleura. As it enters the pleural cavity, the blunt point of the needle will push the visceral pleura and lungs before it, creating a space into which the inoculum is deposited

through its lateral perforations. The needle is quickly withdrawn and the incision closed with interrupted silk sutures.

11. *Into the Lungs*—The preparation and location for this inoculation is the same as for the intrapleural except for the skin incision which is unnecessary. A sharp pointed, 24 gauge, ½″ hypodermic needle is passed at right angles through the 5th intercostal space at a point midway between the sternum and the neck of the ribs, into the thoracic cavity. An insertion of 5/16″ will insure its penetration of the lung tissue.

12. *Intratracheal*—It is very difficult to inject material into the respiratory tract and localize it at a given point. If an infective substance is injected into the nasal passages, in all probability some of it will also reach the lungs. Conversely, injections made into the trachea intended for the lower respiratory tract may readily be coughed up and infect the upper. However, an intratracheal injection is more sure to reach the bronchi than one from the upper passages.

The guinea pig is fixed in the dorsal position with the head and neck extended as for an intravenous inoculation. The throat region is clipped, shaved, and disinfected. General anesthesia is necessary.

An incision of 1″ is made through the skin and subcutaneous tissue along the median line of the ventral surface of the neck. The skin flaps are retracted with forceps. The trachea is exposed by bluntly dissecting the cellular and muscular tissues which cover it. Care must be exercised not to injure the major blood vessels and nerves which lie in close proximity. A syringe with a 24 gauge, ¼″ hypodermic needle, is used. Insert needle between tracheal rings. At the moment of injection the animal's body should be inclined upward at an angle of 45° to facilitate passage of the inoculum into the bronchi. Only a few drops may be injected or the guinea pig will suffocate. The incision is closed with interrupted silk sutures.

13. *Oral Administration*—Various substances may be given by rubbing them inside the cheeks or pipetting small quantities into the mouth. However, the surest means of reaching the digestive tract is to deposit the material directly into the stomach. This is accomplished by means of a small, soft rubber male catheter. The pig is restrained by placing it upright in a cylindrical mailing case small enough to restrict its movements adequately with head and neck exposed. The animal's jaws are held apart by an assistant with a rubber band placed around the upper jaw and one around the lower to prevent biting the tube. If unassisted, a small piece of wood, with a hole bored through its center for the tube, is placed in the animal's mouth and held in position with the left hand which encircles the head. With the right hand, the tube is passed through the hole and along the soft palate until it reaches the esophageal orifice. At this point it is vibrated against the epiglottis to cause the animal to swallow and then passed down the esophagus into the stomach. The material is forced through the tube with a hypodermic syringe. However, before the injection is made, the tube should be allowed to remain in position for 30 seconds and if the animal's respiratory movements continue to be regular and there is no coughing, the operator is assured that the tube has passed into the stomach and not into the lungs—4 to 5″ of tube are required to reach the stomach from the entrance of the mouth.

14. *Abdominal Organs* — All organs which lie within the abdominal cavity must be injected through an incision in the wall unless they are provided with external openings. A detailed description of their location would exceed the limitations of this paper and would

be secondary in value to the information which the technician might and should obtain through actual dissection of the cadaver. The technic of inoculating the various organs may be included with the following suggestions:

a. A preliminary laporotomy is always indicated. No attempt should ever be made to inject an organ by inserting a needle through the skin and hoping to contact it.

b. The abdominal incision should be large enough for easy identification and manipulation of the organ involved.

c. The location of the laporotomy must be varied to suit the location of the various organs.

d. The operations must be performed with due regard to asepsis to prevent complication of results through accidentally introduced infections.

e. Food and water should be withheld from the guinea pig 24 hours prior to the time of operation to facilitate the manipulation of intestines.

f. General anesthesia is always indicated.

Housing: Your Problem and Ours*

CHARLES PORTER, M.D., M.R.C.P., Hon. F.A.P.H.A.

Barrister-at-Law, London, England

NEITHER on the first occasion when as a health officer and guest of your Public Health Service, I visited America, nor on the last, when I came as a delegate to the Annual Conference at Montreal, did I hear much talk of housing; nor had I demonstrated to me anything of the conditions under which the people of the class—the lower wage earning class—among whom my own work lay in London, live. Even at my first visit sixteen years ago, I made note in various parts of the country of conditions that appeared to me to warrant the belief that there was a housing problem. I noted also that if its existence had not then been recognized by the health authorities there would surely come a time when they would be compelled to recognize it, and take steps to deal with it.

That I should have noted these conditions and felt as I did with regard to them, was not strange. I came from a country in many parts of which bad housing conditions were commonplace and inescapable by the health workers. From the earliest days of my association with public health, as a student even, I had been aware of the existence of defects in housing; had seen the staffs of the various health departments with which I was connected devoting endless days to attempts to find remedies for irremediable conditions; bombarding landlords with orders to carry out repairs; dragging the recalcitrants before the courts in order that they might be punished for failing to apply further patches to premises already a collection of patches.

In the talk, private and public, of health officers, the word "slum" eternally recurred and the search for the cause of this or that almost inevitably led to housing conditions, and the solution of every public health problem depended in the first instance on a solution of the housing problem; but of all the health problems there was none so consistently evaded as that connected with housing. Of reasons for evasion there were multitudes; and of means and methods of evasion almost as many.

Actually, the question was one of responsibility, affecting the shoulders upon which the burden should be laid—those of the owners of the property, the "slum landlords"—or the general body of ratepayers and taxpayers, through the local and national governing bodies and exchequer. The aim at the beginning, if not indeed most of the time, was to avoid shouldering responsibility. Continually they were maneuvering, each side seeking opportunity to—if I may borrow your very expressive word—outsmart the other. Probably they recognized it, but always it was a losing fight in which the private and individual property owners were engaged.

Inevitably the governing bodies must

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win. The last move was always theirs, and even though they might make concessions, they were always the least they could make. Always such concessions as they made were accompanied by a slight tightening of the screw. In order to stop progress, to secure the maximum of concession and the minimum of twist to the screw, there were all sorts of banding together of property owners. Also there was always present in every local governing body a very considerable number of individuals whose whole object in seeking election and whose sole aim was to protect their own interests and those of other owners of low grade property.

To health officers in particular, these organizations and individuals proved highly troublesome. In some cases simply a thorn in the flesh, in others they were more than a mere irritant, their weapons used against the unfortunate health workers being so strong and so barbed that the struggle became useless. This was all the more definitely the case, since the only weapon at the disposal of the officers was a collection of laws largely made by those who were against them. As the bulk of the powers given in the laws were placed for administration in the hands, not of the officers, but of the local governing bodies, the chances that great activity would be shown were few. Even the few powers that were given to the officers in the more difficult areas, they dared not use, in spite of the fact that, because the law had given them what is called "security of tenure," they appeared to be in a very strong position. Any action though so provided for in the legislation that it seemed to be compulsory, was doomed to failure. No action, therefore, was taken and all that was left was talk, and talk by health officers with regard to housing was endless.

Though approving for propaganda purposes statements such as those that follow, taken from the Ministry of Health brochure *About Housing*, I would never pretend that they would come through any properly applied scientific or statistical examination, having regard particularly to the result of the investigation carried out by the late Dr. M'Gonigle, of Stockton-on-Tees. This revealed quite definitely that there was, if anything, a worsening in the condition of the families transferred from slums to new dwellings, and that most who remained behind in the slum areas fared better, from the health point of view, than those who were transferred. These results raised doubts of the accuracy of statements made in *About Housing* to the effect that—

> . . . the evil effect of bad housing tell not only on the individual, but also on the general welfare of the community, and are to be found in many fields of public health. In districts where housing standards have always been low and where overcrowding is rife, the incidence of tuberculosis and of infant and maternal mortality is almost invariably higher than the average, sometimes very much higher.

Almost invariably discussions initiated by health officers upon housing ended in a decision that the problem was economic mainly and only finance could solve it.

The people who lived under deplorable conditions in the defective dwellings did so because they could not afford anything better. If they were to be better housed, it would have to be largely at somebody else's expense: "and I," said the property owner, "am not prepared to play the part of a public benefactor": "and we," said the local authorities, "cannot, because the law will not allow us." This, at the time, was actually the case; and the officers who complained of the inadequacies of the law were right in doing so. The law was inadequate very largely because at the time it was made there was still a strong belief that an owner of property had rights, almost divine

and inalienable, and that one of the aims of any law must be to protect these rights.

The people who administered them—the local government bodies particularly, since they contained more than a sprinkling of property owners—were ardent believers also. It is quite a considerable time since laws of the kind I have in mind and that my predecessors inveighed against, operated. It is useless, therefore, to say more with regard to them than that though they provided for closure and demolition of unfit dwellings, for clearing away of slums and their replacement by houses fit for humans to live in, and even for the erection of such premises independently of slum clearance, the procedure was so unbelievably, almost ludicrously, complicated, as to discourage any except the bravest and most progressive of authorities and officers. Moreover, though the law sought to tighten the financial burden that was to be laid upon the ratepayers in the places where slums were cleared, and houses for the less fortunate and the more poorly paid inhabitants erected, the terms offered were so ungenerous as to be definitely discouraging.

Generally, in fact, local authorities refused to have anything to do with slum clearance and the provision of municipal dwellings. Even though it was clearly imposed upon medical officers of health as a duty that they should condemn and make representation of slum areas, the duty was neglected. Local authorities, who on receiving a representation from a health officer, were required to take steps to see that the offending area was cleared, were given nothing of the kind to do. Everybody was content to proceed as if there were no special housing and slum clearance provisions, trying to get as many new houses as possible erected by private enterprise, and stimulating and compelling owners of existing poor class property to patch and prop it up as well as possible.

In some quarters attempts were made to have the law amended and simplified and to secure terms more generous. Many of these attempts were successful, and from time to time legislation that did offer encouragement to take action was enacted. Progress was slow, however, and quite an appreciable period elapsed before local authorities really grasped that no matter how loudly they might declare that they were not their poorer brothers' housemakers, were not public benefactors so far as the housing of particular sections of the population was concerned, they were in fact responsible and must accept responsibility on behalf of the ratepayers and taxpayers for providing housing accommodation for the lower paid workers. That it could not be left to private enterprise was obvious, since reasonable and economic rents from the persons to be housed were not obtainable.

Even voluntary organizations, the so-called housing associations, could not be expected to provide the amount of accommodation needed, the funds at their disposal being entirely inadequate. In regard to voluntary associations, though with us there is much talk of the amount of housing they do, in comparison with local authorities, their contribution is insignificant. This, of course, is as it should be, the responsibility being upon the authorities, not only legally imposed by Act of Parliament, but morally as well. In all probability it was the war—that of 1914-1918—that brought realizations of their responsibilities to the local authorities, or some of them at least.

One thing that war did reveal was the existence of an alarming shortage of housing accommodation. Not alone to the authorities was this revealed. The men returning from the various fronts discovered it. Promised homes

fit for heroes to live in, being heroes, they were surprised there were practically no homes of any kind for a great many of them, particularly if they desired, as so many of them did, to marry and settle down. Why they should have been surprised to find a housing shortage is difficult to understand. Naturally, during the four years of the war house building was entirely at a standstill.

Not only was there no house building between 1914 and 1918, but in many of the years before that the amount of house building of the necessary kind was the very minimum. For this, the policy in relation to taxation was blamed. In any case, during the twenty years before the war, the number of houses built year by year gradually diminished, the total number being something under 2,000,000 For all of these private enterprise was responsible, and for economic reasons it did little or nothing for the lower wage earner. During the twenty years since the war —in spite of the fact that for at least four years, 1919-1923, the building industry was disorganized—over 4,000,000 houses have been built.

As showing the extent to which local authorities have come to accept responsibility in this matter of housing provision, note that of the 4,000,000, they built 1,000,000, private enterprise providing the remaining 3,000,000, most of them no doubt for occupation by persons able to pay a reasonable purchase price or an economic rent. Of the 4,000,000 post-war houses, about 1,500,000 were built with moneys partly derived from public funds. Of these 1,500,000 houses, 1,000,000 have been built by local authorities and 500,000 by private enterprise.

It is in this matter of financial assistance for house building purposes that the greatest change in the British housing policy has taken place. It was because, in fact, of the determination to afford financial assistance and the introduction of legislation providing for it, that the way to a solution of the housing problem in Great Britain was opened up: that, in effect, there ceased to be a housing problem or, at any rate, a housing problem so hopeless as at one time it appeared to be. The change in the point of view and the determination to go ahead and provide housing, no matter what it might cost, did not take place all at once. A great deal of propaganda had to be carried on among local authorities and the public as well. This was natural, having regard to the fact that expenditure that was vast and might well be continuous for a long period had to be faced. What is called the "national conscience," however, was in course of time aroused, and all the necessary laws were passed and sums raised and provided.

Actually the amount of legislation passed is very large. Also it is very complicated, since there is involved so much interference with the owners and the ownership of property and the rights thereof, which the legal profession is determined shall not too lightly —or inexpensively—be violated. Just how many laws there are, and the extent of their complications, I need not say. Nor is it necessary for me to dwell upon the amount of trouble and worry they cause the health officers, medical and other, both in and out of the witness chair.

As to the expenditure involved and provided for in the legislation, it is learned from the report of the Ministry of Health for 1937-1938, that between 1919 and 1938 this totalled something like 3,200 million dollars (795 millions sterling). The total annual contribution from public funds toward the provision of housing accommodation and the solution of the housing problem is over 76 million dollars (19 millions sterling).

A great part of these colossal sums—

colossal because the population to be dealt with is not very large and the amount of housing (about 12,000,000 houses) not great when compared with the United States—has gone, and goes, on slum clearance and the provision of dwellings to take the place of the slum property destroyed. Actually up to the time war broke out again, throughout the country the slums were being cleared at the rate of more than 1,000 people every day. More recently, expenditure has had to be incurred and anticipated on account of placing upon the authorities the responsibility of getting rid of overcrowding.

Of all the problems connected with housing, so far as the health officer is concerned, none has proved more troublesome than that of overcrowding. Always in the Public Health Acts powers for dealing with it were provided. The difficulty, however, was to put them into operation, largely because there was nowhere for the overcrowded families to go, even if they could—as they generally could not—afford to pay for the accommodation.

In relation to overcrowding, the "national conscience" was strongly roused some two or three years ago. Why and how nobody seemed to know. Actually it constituted something of a triumph for propaganda. One day we health officers were plodding along trying to get rid of overcrowding with the powers we had long possessed; and the next we found ourselves relieved of a burden and all set for a solution that was to be complete and lasting. Perhaps it was not quite so simple as that. Actually what was done—and undoubtedly propaganda and publicity had much to do with it—was to make a law with regard to the amount of space that must be provided per person in a house and to require local authorities to make a survey of their districts in order to discover the number of persons living under over-crowded conditions, that is to say, in houses in which there was less than the standard amount of space; and to discover also how much extra accommodation was required to obviate the overcrowding. In addition, provision was also made for the punishment of persons who lived under overcrowded conditions after the additional accommodation had been provided. As a result of the surveys it has been discovered that in England and Wales there are about 430,000 unfit houses and some 340,000 overcrowded houses. To meet all needs it has been estimated that in order to complete the present program some 600,000 houses will be required. About half this number had been provided before the outbreak of war, and if the activity could have been continued not only the slum, but the overcrowding problem also, would have been solved within five years; and in the words of the Minister of Health we should have seen established "in new and healthy homes about 3,000,000 men, women, and children, who have been living in unfit or overcrowded homes."

This task never will be completed without a continuance of public interest and the expenditure of money from rates and taxes. So far as expenditure is concerned, originally it was anticipated that, annually, for about forty years, there would be required about 3½ million pounds sterling—say 15 million dollars. The charge already borne since the Armistice of 1918 is round about 1,250 million dollars (250 millions sterling). So far as continuance of public interest is concerned, no doubt as in the past this will be brought about by the publication, each year in the annual report of each medical officer of health in the country, of facts and figures relating to housing, the number of inspections made, of houses condemned for destruction, of slums cleared, of houses erected, and so on; by the publication monthly of facts

and figures relating to housing by the Ministry of Health; by the publication from time to time of special books, booklets, and pamphlets of the type of the brochure *About Housing*, already mentioned, and the most attractive volume which is rather like your *Healthful Housing*, called "Houses We Live In." The price of this is 1 shilling (about 25 cents), *About Housing* being cheaper. Both have sold extremely well.

I am very conscious of the inadequacies of this paper. Very definitely, I fear that it contains little that can be regarded as a contribution to the knowledge you in the United States already possess with regard to the housing problem. It does show—if anything—that the problem of housing is basically economic; that in order to solve it, private enterprise and the public bodies must coöperate, the latter accepting responsibility and rendering such financial assistance out of the public funds as appears necessary. Finally, with the object of insuring that the people shall be kept continually aware, not only of the needs, but of the steps taken to meet them, every effort should be made to educate them; and there should be the widest publicity and the fullest possible resort to propaganda.

Development of a Health Education Program*

Navajo Indians

EDNA A. GERKEN, C.P.H., F.A.P.H.A.

Supervisor, Health Education, Office of Indian Affairs, Department of the Interior, Washington, D. C.

A PRESENTATION of some practical procedures in the development of a health education program, drawn from experiences with a group of American Indians, the Navajos, may be of interest to those concerned with child health. These experiences are significant because, in dealing with primitive people, it is necessary to disregard everything but the most basic fundamentals and, therefore, needs and relationships are more clearly perceived than in programs dealing with a more complex culture.

In northern New Mexico and Arizona live some 45,000 members of the Navajo tribe. They are nomadic people, living in isolation, tending their flocks on the desert, and retaining the habits and customs that have persisted among them for many generations. While, to a large degree, untouched by modern civilization in ways of thinking and living, physical changes in their environment have inevitably crept in. Health problems for them grow in large measure out of the fact that satisfactory adjustments to these changes have not been made. New foods, highly refined and hence impoverished, are now being sold in every trading post. Substituted for the natural foods formerly eaten, their use contributes to malnutrition and dental caries. Automobiles and improved roads are bringing closer contact among family units on the reservation, facilitating the spread of communicable diseases and increasing the need for modern methods of sanitation to control this.

Cultural factors also contribute to the health problems here. The people, for example, believe that disease is caused by the violation of some taboo, by getting out of harmony with the universe, by the wandering away of the patient's soul, or by the entrance of some foreign object into the body. To correct these maladjustments they have a firm conviction that the medicine man or "chanter" by an appropriate ceremony or "sing" can charm the foreign object out, atone for the broken taboo, or bring back the wandering spirit. They have no real concept of the germ theory of disease and the sanitary practices this involves. The Navajo language does not, in fact, contain any word for "germ."

Lack of health knowledge and skills, particularly in regard to the care of infants and children is another factor contributing to high morbidity and mortality rates. Medical and nursing

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services and hospital care are not understood or generally accepted, although these are available in the area.

It is obvious that under the circumstances described no health program can function effectively without education. It would be difficult to find a situation where the need of health education is more clearly indicated. However, these conditions are not peculiar to Navajos alone. Similar problems will be met in any community, white or Indian, rural or urban, where ignorance persists and people lack scientific knowledge concerning health.

In 1937 when the medical and nursing personnel of the Navajo area met with their medical director to discuss plans and policies for carrying on the health program, they extended an invitation to leaders in Navajo education to join the conference. This was done because the medical, as well as the educational group, recognized that while schools provide excellent opportunities for general health education and specific instruction in home nursing, infant care, and first aid, all of which help to make the health service program more effective, collaboration of education and health personnel in the development of the health education program is essential to its soundness. A program prepared without such collaboration is often justly criticised by the medical group because the subject matter is unwisely chosen, giving false impressions, if not itself actually false. On the other hand, all too frequently a health teaching program planned by the health personnel and hence basically sound is unsuited to the age and interests of the children concerned and the methods of presentation are in disagreement with modern educational procedures being used elsewhere in the school.

To avoid such difficulties and provide adequately for the health education needs of the Navajos, a Joint Health Education Committee was formed. Its membership included the director of schools, school supervisors, and a classroom teacher, the medical directors for the area and for the district, a hospital physician, and a public health nurse. The function of the committee was to formulate general policies for the health education program, to determine the respective responsibilities of medical and teaching personnel in carrying it out, and to indicate its general content.

In discharging its functions, the task of formulating detailed plans, preparing materials, and suggesting methods was referred to sub-committees. These sub-committees worked under the leadership of a health educator who was available in the area for a few months. They were composed of classroom teachers, public health nurses, and home economics teachers, who were close to the actual problems in the field. A physician was appointed to each subcommittee to give technical assistance in the selection of subject matter suited to the needs of the Navajos.

The use of these working committees made it possible for the Joint Health Education Committee to accomplish its purpose with a minimum of actual time expended, holding only three all day sessions at intervals of several months apart. This is an important factor to consider in working with people who have administrative and supervisory responsibilities and whose time is necessarily limited.

The merits of this procedure in joint planning were twofold. First, the program prepared was acceptable to both educational and health authorities and hence supported by them. The medical group safeguarded the technical aspects and guided the choice of content in accordance with observed needs, while the educational group assisted in the selection of teaching activities suited to the abilities of those to be taught and suggested methods in accord with present-day educational policies. Second,

the health problems of the area were clearly defined, and agreement was reached as to the points upon which educational effort should center.

The Joint Health Education Committee limited its proposed health education program for the Navajo schools to three basic problems, viz., the control of communicable diseases, the control of infant mortality and morbidity, and first aid and safety. It suggested activities for the school which would contribute most effectively to the solution of these problems. Arrangements were made for the trial use of this material in a limited area under supervision. After final revision by the Joint Health Education Committee, it was mimeographed and distributed to the field where its use was encouraged by the medical and educational directors and their supervisors.

Certain factors in Navajo life were given special consideration by the Joint Health Education Committee when organizing its policies and plans in the belief that the development of an effective program requires attention to the distinctive features of the group involved. While the following statements were regarded as peculiarly characteristic of the Navajo area, elements of the same situations may be found in almost any group of people and should be recognized in program planning.

1. *The largest group of children available for instruction is that which comes to day school, where attendance is irregular, language handicaps exist, and children leave school at an early age.* Education in health must be planned to reach this group under these conditions. Many things which are considered desirable in a health education program must, perforce, be omitted and attention focused on the factors which are most vitally significant in the welfare of these people.

For the day school group the activities suggested to meet the basic problems of communicable disease control, infant mortality, and first aid and safety are: (1) establishing correct health practices in connection with daily living at school; (2) developing a friendly feeling toward the personnel of the medical staff and an appreciation of the value of the services of the doctor, the nurse, and the dentist; (3) demonstrating the presence of microscopic life and explaining its significance in sanitary practices; (4) teaching facts about trachoma and tuberculosis (the two outstanding communicable diseases in the area) and their prevention and control; (5) teaching infant care suitable for young children who help care for babies at home; and (6) teaching simple first aid in connection with situations which arise at school.

Because of the daily contact between school and home there is a possibility that this health education will influence the adult as well as the child and therefore bring improvements in home practices. It was, however, agreed that the education of the adult is the responsibility of the medical and nursing group, to be carried out in hospital, clinic, and field in connection with giving health services.

2. *The Navajo, as is true with many other people, does not readily change his ways of living and must himself recognize the desirability of any change before it is accepted.* The committee believed that the task of education is to help the Navajo to solve his own problems in his own way by giving him practical demonstrations in the day school and allowing him to make his own adaptations. It is suggested that the school, which provides facilities and instruction in bathing, laundering, cooking, sewing, and blacksmithing, plan its program of activities as nearly on the level of hogan life as possible so that the routine practices in daily living at the school will seem desirable because within reach of the hogan.

This policy of giving instruction on a basis in keeping with the background of the people who will use it is also followed in the secondary boarding school program.

3. *The Navajo has no knowledge of bacterial life and does not understand the procedures advocated for communicable disease control.* No one can be forced to accept scientific ideas regarding disease and its prevention. The Indian is not different from the white man in this. Educated men in the day of Koch, and Lister, and Pasteur required much demonstration and proof before they accepted the germ theory of disease and the technic of asepsis. Even in the present generation instances can be cited of groups of people who failed to accept modern methods for the control of malaria, of hookworm, and of pellagra until an educational program made clear the value of these. The Joint Health Education Committee for the Navajo area agreed that adequate explanation of the causes of disease and methods of control must be made if the Navajos are to accept modern procedures for protecting themselves from communicable disease.

One of the most significant features of the health education program for the Navajo group is the attention given to this instruction. It has been found to be feasible and desirable to build up concepts in the minds of Navajo children, as well as adults, which will help them to understand the reasons why sanitary practices are advocated. This is done through the laboratory approach, beginning very early in school life. The idea of disease germs is presented only after a background of knowledge of microscopic life has been laid. The instructions are concrete and visual rather than abstract theory.

The principle of magnifying familiar objects through the use of a hand lens is first taught. Later the compound microscope and small forms of life such as protozoa and algae are demonstrated. The fact that boiling and sunlight and drying destroy such life is demonstrated. This is followed by the preparation of "germ gardens" using the simple equipment available in any home or school. The development of bacterial colonies from the feet of a fly, from droplets in coughs or sneezes, from fingerprints, and dust is shown.

After this preliminary work the children are ready for a simple explanation of the fact that certain germs cause certain diseases, and that these diseases can be prevented if the particular germs do not enter the body. They learn too, that the germs of a disease always come from a case of the disease. This paves the way for the discussion of a new term, "dangerous dirt" referring to any discharge from the body (since it is not always possible to know whether disease germs are present or not). The desirability of sanitary practices with reference to any body discharge is readily agreed upon after this practical explanation. Incidentally, it has been found useful to distinguish between "dangerous dirt" and "clean dirt" in this land where water is at a premium and there is no social value attached to cleanliness as such.

4. *The Navajo father as well as the mother exercises control over the activities of family life and needs preparation for this responsibility.* In planning the health education program, efforts were made to provide certain basic instruction in health for boys as well as girls. Special recognition was given to the fact that boys need to understand the fundamental requirements in infant care and in home care of the sick even though they may not be expected to acquire special skills in these. A group of young Navajo women expressed the need thus, "Even though we know the care the mother and baby should have, it will do us no good if our men do not understand it, too!"

5. *Children in the home are often caretakers of babies and have considerable responsibility.* The Joint Health Education Committee was able to suggest simple instruction which can be given to very young children. This dealt chiefly with cleanliness and choice of foods suitable for the baby. The material is used in connection with the development of a vocabulary and in the routine teaching of reading.

Since infant death rates are high in the area an outline was prepared giving the simple essentials in infant and maternal care which the physicians felt might help to improve this situation if taught in the home-making classes in school. The suggestions in this outline are very practical, based on the needs of the Navajo home. The Joint Committee recommended that instruction be given on the basis of actual care of a baby in the school, and in a number of instances it has been possible to arrange for this. Boys as well as girls are given an opportunity to assume some responsibility for the child. Teaching and health personnel share the responsibility for supervising this project. The monthly check-up of the child by the physician is giving these young people an appreciation of the help that the medical profession can give in safeguarding child life and will, it is believed, in time make it possible for the area to inaugurate a program of well baby conferences. (These are at present not possible because not supported by the people.)

6. *Medical and nursing and hospital care are not generally understood and accepted by the Navajo people.* The program planned suggests that special attention be given to encouraging friendly relationships between the professional group and the children. Outstanding members of the medical group have recognized that much of the success of this activity depends upon the effort the doctors make to establish confidence and they are coöperating with the teachers to that end. On the recommendation of the Joint Committee arrangements have been made in many instances to take groups of school children to visit the hospital in order that some of the fear of hospitals and doctors, which is in part due to unfamiliarity, may be overcome. In the celebration of Hospital Day hundreds of Navajos were brought to the twelve hospitals of the area for the same purpose.

When the new base hospital was completed the medical director invited the leading Navajo medicine men to participate in its dedication, recognizing the fact that they are the spiritual leaders of their people. "In a most impressive manner they scattered cornmeal and pollen to the four points of the compass and chanted their songs and prayers while standing on a ceremonial robe." This was an important step toward acceptance of the hospital as their own. It is in line with modern educational procedures which recognize participation as important in the learning process.

7. *The equipment in the Navajo home is meager and not at all comparable to that of the average modern home.* The typical hogan is a single room made of logs or stone with a dirt floor. There is an open fire in the center. The only openings are the door on the east and the smoke hole in the dome shaped top. The family sleeps on the ground on sheep skins. The Joint Health Education Committee felt that instruction in home nursing would help establish better home practices in the care of minor illnesses, and in the control of communicable diseases, at the same time giving the Navajo some knowledge of the services a hospital can give the sick. In keeping with modern educational methods, such instruction must be integrated in home-making courses rather than given as a

unit, and accordingly the committee recommended that it be taught by the home-making teacher with the assistance of a nurse when possible for the technical phases of the work. No available text on home nursing was found which met the requirements of this particular environment and culture. For that reason a sub-committee was appointed for the purpose of preparing simple instructional material based directly on the needs of this group. In doing this the sub-committee held conferences with a small group of outstanding Navajo women in order to insure the acceptability and suitability of the material.

SUMMARY

Leaders in both health and educational fields in the Navajo area have coöperated in studying their health problems and in formulating plans to meet them through education. Workers in the field now have at hand definite information regarding the health needs of the area with specific suggestions as to health education activities which may be helpful in meeting these.

Subject matter which is simple and appropriate for use with the Navajos has been put at their disposal. They can now go ahead with assurance that the efforts they make in line with these suggestions and in the use of this material will be effective.

The procedure followed has proved valuable in the development of plans suitable for use with this particular group of people with their distinct problems. More or less identical problems can be found in many rural communities today. In fact, many urban areas are operating under much the same needs. Health education must therefore be a vital part of programs in such areas. The methods tried here might well be used to further the work in child health in any locality. No ready-made program can ever meet the needs as effectively as one prepared by a local group. It seems essential that medical and educational workers learn to coöperate for such purposes. Educators without the technical assistance of professional health workers may foster health education programs which are unsound. Professional health workers in turn without the assistance of trained educators may offend every principle of good teaching because they do not realize that the presentation of facts is not enough and that there must be gradation in material and method based on the child's interest and needs if the program is to function. Children will benefit more fully when the two groups of trained personnel join forces for the common goal of child health.

How Can the Health Officer Make Greater Use of the Health Education Specialist?*

I. C. RIGGIN, M.D., F.A.P.H.A.

Commissioner of Health, State Department of Health, Richmond, Va.

TO a group such as this it is unnecessary to emphasize the importance of educational activities in a state department of health. However, it might be well to mention some retrospective facts as a basis for a clearer appreciation of present problems in that field.

When state health departments, as distinguished from the earlier and usually semi-latent boards of health, began to function actively, problems such as the establishment of safe water and milk supplies, tuberculosis sanatoria, more comprehensive control of communicable diseases, and community sanitation occupied the attention of health administrators. By the very nature of these problems, personal cooperation on the part of the public, though involved, was not paramount.

For example, filtration, chlorination, pasteurization, environmental sanitation, tuberculosis, and even smallpox programs, were handled on a mass basis. Loans for water purification plants, milk control ordinances in large cities, quarantine regulations for the curbing of epidemics, sanitation rules, tuberculosis clinics, and truancy legislation to enforce smallpox vaccination are instances of the factors which at that time were uppermost in the minds of state health officials. In short, the conditions which most readily lent themselves to group control measures were considered the most urgent from both the professional and the practical standpoints.

While, as you are well aware, these problems still occupy the constant attention of health department personnel, the rapid progress in these various fields made possible, in a very few years, a more individualistic interest in public health work than hitherto had existed. Consequently, chest, prenatal, well baby, and venereal disease clinics as well as immunization drives and other similar activities naturally followed the successes experienced in the less personal endeavors.

It was promptly recognized, however, that a public opinion which would result in sympathetic and intelligent action was a basic need in attaining the objectives involved in these newer efforts. It was also appreciated that to change indifference to such matters to active interest required more than field demonstrations. Some kind of health education obviously was needed. So, health departments, though still not especially conscious of the vital need of this type of activity, began to look around for help. Usually, their inves-

* Read at a Joint Session of the Health Officers and Public Health Education Sections of the American Public Health Association at the Sixty-eighth Annual Meeting in Pittsburgh, Pa., October 17, 1939.

tigation was limited to their own personnel.

Indeed, as late as 1921 in the majority of health departments, health education was far from a crystallized activity. To a large extent, it was anybody's business. And, as intimated, the work fell more or less into the hands of those members of the staff who had, or believed they had, natural literary or publicity skill. It was to such staff members that the duty of enlisting the coöperation of the public was assigned, the work being conducted in many health departments as an added rather than as an exclusive duty.

In passing, it may be said that a number of those who voluntarily assumed educational work in health departments had not misjudged their ability as some of the present nationally known names in that field eloquently testify. As a matter of fact, it was this very small group of pioneers who, by performance, helped to emphasize the basic importance of health education.

Today, all health department directors are alive to the value of publicizing their health programs and of informing the laity that public health measures require the active interest of the individual if maximum results are to be obtained.

But the administrators also know well, as has been demonstrated in campaigns to reduce the number of deaths from diphtheria, cancer, tuberculosis, and appendicitis, that educating the people to help themselves to health is one of the strongest influences in reducing mortality and illness from preventable causes. They realize that the problem of these avoidable casualties is a challenging one. That the art of translating scientific, medical, and even commonplace health facts into an interesting and activating form demands particular aptitude and experience also has been obvious for some time.

Health education, and with it the health educator, has grown up. No longer is this work viewed as a collateral or incidental department function. It has reached its stature, though by no means its maturity. Indeed, today as never before, public health officers realize that the pronouncement regarding the importance of health education, made at the first meeting of the American Public Health Association in 1872, was absolutely sound.

While it is not within the purview of this paper to detail the essential characteristics of health educational work, it may be remarked that the quality of such activities can readily be measured by the editorial acceptance of the syndicated press or news releases, by the reader reaction to the departmental publications prepared for popular consumption, by the listener appreciation of departmental broadcasts, and by response to platform presentations. May I emphasize that the success of any health educational program rests on the intelligent selection of personnel whose aptitude for this kind of work already has been demonstrated or is readily demonstrable.

As a means of increasing the usefulness of the specialist in health education perhaps a closer coöperation with the state medical society could be developed. This organization can be one of the most powerful educational influences in a state. Moreover, its willingness to work with state departments of health has been demonstrated on many occasions. Anti-diphtheria drives, pneumonia typing and pneumothorax services, appendicitis and crippled children's surveys are practical instances of significantly successful educational work on the part of state and component medical societies.

Merely as an illustration of possible further coöperation between the state medical society and the health education specialist, a state health department may desire to present cancer facts

in popular form to students of state teachers' colleges and to women's and coeducational institutions of higher learning within its jurisdiction. The commissioner of health enlists the sympathy of the public relations committee of the state medical society in the undertaking. The plan being approved by that group, all details for developing the schedule and the preparation and presentation of the lecture at the various institutions would devolve upon the health education specialist. However, the joint auspices of the undertaking would be emphasized in all of the campaign communications and in the attendant publicity. Quite aside from the conceivable benefits of efforts of this kind, is the practical policy of tying in the medical society with statewide educational activities of this kind.

Again, the advantages of an annual community health educational program under the mutual auspices of county medical societies, county health departments, and the state department of health may be evident. Here, also, the work of promoting the plan, coöperating in the development of local programs, preparation of press releases, arranging for motion pictures, and related interests, could be properly delegated by the commissioner of health to the health educator.

It also may be possible to bring into closer coöperation the work of the health education specialist and the women's auxiliaries of the state medical society. As an illustration, the health educational specialist, through the chairman of the state public relations committee of the women's auxiliary, could definitely assist in developing an annual physical examination campaign among their own members, the initiative for such a program having been taken directly or indirectly by the commissioner of health.

Similarly, the specialist perhaps could be used to develop syndicated dental health releases in coöperation with the public relations committee of the state dental society. This field of health education has not yet been emphasized in most states. As you know, sporadic attempts on the part of state or local dental societies to issue such releases in the press have not been successful because of a decided reluctance of the press to open its news columns to other than official governmental agencies. Moreover, the advantages of a closer connection with the state dental association by means of joint dental educational activity is clear.

Viewed more personally, a closer working arrangement between the respective county medical directors and the health education specialist seems to be indicated. Localized health education is extremely, indeed vitally, important. The editorial services of the health educator, and his professional ability in health promotion generally thus could be utilized to a greater extent than now is usual in most jurisdictions.

Once more, the health education specialist can be of service to local health departments by investigating their activities and reporting them in the form of a human interest narrative in the official bulletin. In my own state, this work promises to be of educational and promotional value.

In some jurisdictions, at least, it is likely that a closer relationship than now exists could be developed between the health education specialist and the state department of education through its divisions of health and physical education.

It is also believed that the health education specialist could increase his value to the health department and to the cause of public health by doing more public speaking—provided, of course, his aptitude in this field is adequate. It should be his duty to present popular health subjects before service

clubs, civic organizations, and student bodies, thereby in large measure relieving the commissioner and bureau chiefs of such engagements and limiting their addresses to the more scientific phases of the program before essential professional groups.

Likewise, popular presentations over the radio could well be taken care of to a greater extent by the specialist. Incidentally, in Virginia the State Department of Health, through its office of health education, recently has developed a state-wide radio coverage for one hundred "Health Hints"—brief talks on health adapted for radio use from weekly newspaper releases prepared by its office of health education. County health directors broadcast the talks where possible. Where the local station is not in a health officer county, the talks are broadcast by members of the local county medical society or they are incorporated in an already established program.

To some extent at least, these public relations possibilities of the health education specialist have not been sufficiently appreciated by many of us. Too often, this representative is viewed as a bulletin writer and pamphleteer, as a forwarding agent of motion pictures, and as a news source for the papers. Such functions, of course, are essential, but are by no means exclusive. If equal to the job, the specialist should be able to serve in a more personal and more direct way.

I realize that the suggestions that have been made are far from inclusive. They have been offered only as practical examples of extending the usefulness of the specialist in the average state health department, where the health educational work frequently falls upon a single staff member.

Elaborate radio programs, mobile exhibits, motion picture showings, and extensive health demonstrations and exhibits at fairs require more personnel than is available to the usual health department.

You have no doubt observed that the question of technics involved in the suggested broader aspects has been omitted. The technics are details which are not within the limits of this discussion, though it is patent to all of us that the most impressive educational program can be ineffective if they are faulty. Technics depend upon the wisdom and professional capacity of the health education specialist.

CONCLUSION

Given the ability, ambition, and personality, the extent and value of the work of the health educator is limited only by his natural resourcefulness, by an energetically and wisely applied imagination, and by the funds at his disposal.

Health education is being rightfully emphasized as never before. Its importance and its obligations are attracting to it the type of person who can measure up to the size of the job. That the health educator is alive to his possibilities is becoming increasingly evident each day. For health departments, for health education programs, for the public good, modern health education does much. But it promises much more.

Is Health News Fit to Print?*

K. W. GRIMLEY, M.S., F.A.P.H.A.

Director, Bureau of Health Education and Publicity, Jefferson County Board of Health, Birmingham, Ala.

IS health news fit to print? In considering that question, let us first define our terms. And in setting up a criterion of what constitutes fitness to print, let us for purposes of discussion remember we live in an age of power politics, and propaganda, and pragmatism: an age stripped of the niceties of culture, of reticence; even of the nicety of accuracy. I propose to set up therefore, as a definition of fitness to print this test: "Will it be read?" If the health news in question is also true and beautiful, so much the better; but if it is without reader interest, i.e., if it will not be read, both the time of the writer and the space of the newspaper will be economic waste and intellectual lost motion.

This definition brings up a point often lost sight of in discussions of public health and its relationship with the press. In many ways we who work for public health live in a press agent's paradise; a Utopia so complete and so absolute that it lies beyond even the comprehension of the average public relations worker. For example, I once sat through a previous health education sectional meeting in which a very eminent public relations council took up the entire time at his disposal in explaining ways of "breaking into" the newspapers, oblivious of the fact that everywhere, with the fewest of exceptions, the problem of public health education is not to hoodwink reluctant editors into grudgingly printing material. The problem is how to make the best use of the generous, even lavish, editorial space available to us.

In every city in the United States, newspapers *are* interested in public health, interested in coöperating as completely as they may be allowed, with departments of public health and with recognized voluntary health agencies. There is a deep, general feeling that public health is news; that the agencies of public health are really agencies of community betterment; that newspapers, which claim above all else to be institutions for the promotion of civic interest, should lend every assistance to public health education. The problem is not to get health news printed, but to make our health news fit for the printing; to force an affirmative answer to that question "Will it be read?"

We who work in this field held in so much respect can best utilize the help and coöperation so graciously placed at our disposal by cultivating in our turn a respect for this institution we call the press. And we may well begin with fundamentals.

In the first place, we in public health education have a very high regard for our fundamental concept, health. We

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expect our friends to show a great respect for health. Is it too much to ask for us to show an equal respect for the fundamental concept of a newspaper, which is news?

Let us examine this point. A newspaper exists primarily to serve a nebulous element called news. This element is a very effervescent, volatile ingredient, originally present in all news stories, including those relating to public health. If we in the health department have in our hands or our head a good health news story, from which this fleeting ingredient is boiling steadily away, and if we carry this story around hour after hour, probably overnight, and then at some time convenient to us present the stale, flat, insipid residue to our friend the press, we thereby show our disrespect for this fundamental concept *news*. And our editor friend has the perfect right to feel toward us exactly as we should feel toward him if he and all his staff should go out and contract typhoid fever and push our carefully nurtured typhoid curve back to 1895.

In our efforts to utilize to the best advantage the coöperation of our newspapers, after cultivating this respect for news we must develop in our own minds a reasonable respect for the profession of the press, which is journalism.

The front line trenches of the news field are in actual fact thinly held. No newspaper in America has half the reporters it would like to have. Consequently, if you can bring to your editor friend your health news written down in a manner conforming at least to the elementary principles of journalism, you do him a welcome service.

These elementary principles of journalism are not hard to learn. They consist of things and methods of writing you have heard of many times before—such things as the "lead," that first sentence which tells the where and how and why and when and who—as the arrangement of detachable paragraphs whereby the story may be chopped off at any paragraph ending, from the bottom upward, as the necessity of space limitation may require. They include also other less important things like style—say persons, not people; abolition, not abolishment; begin, not commence; gave, not donated; and so on to rules peculiar to individual newspapers. The elements of journalism, or enough of them to help materially can be learned in much less time than is often spent complaining about inaccurate reporting. Even a story dictated to a reporter comes out better if it is originally given in something approaching journalistic form.

Our relationship with the press will be strengthened if in addition to a respect for the fundamental concept of news and a respect for the profession of journalism sufficiently deep to result in our casting health news into ordinary newspaper language, we lastly cultivate a respect and appreciation for the business of the press. By this I mean we should be frank to recognize the limitations imposed by the economic and practical world in which newspapers are published. We must not expect the impossible, either in the length of individual stories or in the volume of health news we expect any individual newspaper to publish. Newspapers have space limitations or space bans which depend on a varying ratio between the amount of news and the amount of advertising space in demand from day to day. There are also other mechanical problems concerned in the publishing of newspapers of which we on the outside know next to nothing.

We have particular need to show respect for the business of newspaper publishing when the question of the suppression of any particular news story arises. It has been our experience that in every case where suppression is needed it is far better to take respon-

sible newspaper executives completely into our confidence rather than to attempt to impose our own censorship.

Because we work in a field in which it is so easy to secure newspaper cooperation, we should guard ourselves against the danger of excess publicity. Any event or institution may be overpublicized. We should take care not to wear out our welcome either with the newspaper or with its readers.

Any discussion of public health in newspapers and magazines would be incomplete without reference to the profound change which has occurred in the publications field during the past few years; namely, the increasing facilities for, the importance of, pictures. One is always tempted to quote the Chinese regarding the relative value of pictures and words. May I instead paraphrase another old saying, in that today faces, not names, make news? It is our firm conviction that for any publicity purpose for any health organization, official or nonofficial, one picture is worth many columns of news stories.

There are certain obvious rules about pictures to which obedience is well worth while. The time element is important because even the most high-speed engraving department lags far behind the linotype. There is a certain journalistic technic in writing effective cut-lines and a certain approved mechanical method of keeping cut-lines and photographs together. With conservative newspapers photographs of certain medical and sanitation subjects of importance to the public health are not acceptable. All these limitations detract not at all from the value of pictures to any publicity or health educational campaign.

In concluding and summarizing the entire question "Is Health News Fit To Print?" it should be pointed out that health news is a welcomed guest in the columns of American newspapers and magazines. If our health news conforms to the ordinary obligations imposed upon guests by the laws of hospitality, it will in truth be very fit to print.

Mechanical System for Record Keeping of Morbidity, Treatment-Progress and Control of Venereal Diseases*

LIDA J. USILTON, F.A.P.H.A.

Senior Statistician, U. S. Public Health Service, Washington, D. C.

THE U. S. Public Health Service has made intensive efforts for two decades not only to determine the extent of the venereal disease problem, but also to measure the effectiveness of existing programs for its prevention and control.

Fragmentary data have been assembled through monthly reports from clinics and private physicians, special censuses of the treatment sources in selected areas, and retrospective studies of clinic records. Analysis of these materials has yielded information on the minimum number of persons infected and the points at which an attack on the problem would be most effective.

It was recognized that a program which would ultimately control the disease must be based upon three major principles: (1) the finding of the infectious or potentially infectious cases; (2) the provision of adequate treatment facilities for the treatment of these cases; (3) the necessary educational and follow-up activity to keep cases under treatment until infectiousness has been permanently eliminated.

Perhaps the major administrative problem in a satisfactory venereal disease program was early recognized to be a record system which would enable a clinic director or administrative officer to analyze periodically clinic activities to insure constancy of aim of the program. A study of existing systems showed that, for the most part, they were tickler files of patients with early syphilis and monthly compilations of persons under treatment, and the drugs and services administered to each. The occasional reviews made of the accumulated case folders generally did not uncover deficiencies in clinic performance in time to correct them. Patients who had lapsed from treatment before receiving maximum benefits had disappeared. The tracing of sources and contacts had become even more difficult with the loss of time. Pregnant women with inadequately treated syphilis had already been delivered; the child, if alive, could not be located.

A system was needed by means of which mass data could be evaluated rapidly and the cases requiring immediate attention could be selected quickly.

Such a system was available in the commercial field, and it remained only to apply it to the keeping of records in

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venereal diseases. If a venereal disease patient could be viewed as having opened an account with the clinic, and each time a treatment was given it was recorded on the punch card, and automatically posted against the patient's account, an up-to-date balance of his medical history would be maintained. With the complete medical records of patients on summary punch cards, it would be possible to make rapid selections of individual cases in need of special services as well as to make current appraisals of treatment activities.

In consequence of these experiences and needs, the mechanical system for reporting the morbidity, treatment-progress and control of venereal diseases was developed.

DEVELOPMENT

Several demonstration projects were established which soon revealed to clinic directors and health officers that the system met a definite supervisory need which had not been fulfilled by previous methods.

The operation of the mechanical reporting system depends upon key punching and tabulating machinery. Such equipment has been installed in 5 states and 3 metropolitan areas. The units in the District of Columbia and Chicago take care of the localities that do not have individual equipment.

In addition to individual patient listings, the mechanical reporting system also provides printed monthly tabulations of clinic populations or case loads and clinic activities or services for all venereal diseases.

These reports replace the existing hand compilations which clinics are required to furnish local and state health departments and the U. S. Public Health Service, and to give clinic directors and health officials data for planning and carrying out effective venereal disease programs.

MATERIALS AND METHODS

In order to adopt the machine system for the reporting of data for venereal diseases, an inventory of the active cases already under treatment must be obtained and a central tabulating unit set up by the state health department to punch all cards and process the data. The procedure used in securing the required information for the continuance of the system consists basically in maintaining an up-to-date record of every service rendered the patient. The treatment source also furnishes a standard report from each new admission for venereal disease. This record gives all the information required to set up the master or summary card in the central tabulating unit. The summary card is punched and held in the central tabulating unit. It is kept current by means of a second punch card known as the progress card. By means of the progress punch card, the treatment source notifies the central tabulating unit each time a service is rendered to the patient. The progress cards are punched in the central tabulating unit and machine-filed with the summary card for the corresponding case. At regular intervals the progress and summary cards are added together by machine. A new summary card is automatically punched, carrying forward the accumulated history to date.

The summary punch card file in the central tabulating unit is a duplicate of the clinic case folder files. However, the information is now in a form that can be made available readily. The summary punch card file lends itself to rapid evaluation to answer any of the questions needed for appraisal of the treatment program or clinic performance. Similar information could be obtained from the case folder file only with tedious, time consuming, belated, and expensive hand tabulations.

The central tabulating unit operates

as a service unit only. It does not in any way relieve those in administrative charge from the responsibility for correct clinic procedure. It merely lifts the burden of clerical routine and provides essential information at a minimum cost. The cost is $1 per case per year. This estimate for the first year of the system in any area is made from the budgets for the first year of the system in a given area where considerable expenditure is necessary for abstracting purposes. It has been found, however, that the cost for succeeding years will be materially reduced. Costs of $.35 to $.40 have already been reached in certain areas.

The average minimum budget for operation of the central tabulating unit is about $15,000 per annum. In areas where the venereal disease load is less than 15,000 to 20,000, it is manifestly not justifiable to install a central tabulating unit for the tabulation of venereal disease reports alone. However, in such areas it has been found that equally applicable procedures have been found in the field of vital statistics, communicable diseases, nursing, maternal and child hygiene, industrial hygiene, laboratory, and other health department activities.

By prorating the cost among the divisions that make use of the central tabulating unit, it makes feasible an economic installation of the system in areas where the venereal disease problem is not so extensive or where the venereal disease program is in the developmental stages.

SUMMARY OF DISCUSSION

Dr. J. F. Blackerby, State Registrar of Kentucky, Louisville, Ky., discussed the use and value of the mechanical system in Kentucky as a service unit not only for the Bureau of Venereal Diseases, but also for vital statistics, laboratories, and county health work. He stated that plans had been completed to extend this service to three bureaus—finance; maternal and child health; and food, drugs, and hotels.

A more complete detailed report of the mechanical reporting system will be found in the March issue of *Venereal Disease Information.*

Bertha Shafer, M.D., Executive Director of The Illinois Social Hygiene League, Chicago, Ill., stated that the information secured through the mechanical system during the past year had proved a valuable aid in clinic control. The individual listings of patients permitted the clinic to concentrate its efforts on the cases presenting the greatest needs. Furthermore, the preparation by machine of the monthly report of clinic activities for state, local, and federal health authorities had relieved the clinic personnel from routine clinical duties so that they could devote more time to the business of treating patients and bringing sources and contacts under medical care.

Problem of Dental Care in the Public Health Program*

FRANK C. CADY, D.D.S., C.P.H., F.A.P.H.A.

Senior Dental Surgeon, U. S. Public Health Service, Washington, D. C.

ONLY in recent years have health agencies given serious thought to the high prevalence of accumulated dental defects. In fact it was only a few years ago that any attempt was made on a nation-wide scale to determine the extent of these defects.

Dental caries is unique among the public health problems, first because it is a chronic unspectacular disease that does not kill directly, and second because it affects the only tissue in the body which cannot repair itself.

Dental caries is generally recognized as a physical impairment which exceeds all others in prevalence. To date there is no effective method for the prevention of the initial lesions of this disease. There are, however, effective methods for the control of these lesions in their incipiency which consists of the removal of carious or defective dental tissue and replacing it with chemically stable filling materials. If begun early in life and continued periodically thereafter, this method of control of dental caries and its sequelae is effective and well adapted to widespread application in dental practice. Obviously then the primary objective of a dental program must be the servicing of the yearly increment of this disease.

In public health administration dental disease is classified generally with those diseases which can be controlled but not prevented. Like syphilis and cancer the program is divided into two main categories—education and early treatment.

From a dental health educational standpoint we generally classify the public into three main groups: (1) those who can well afford dental service but are not informed of the advantage of early and periodical treatment; (2) those who can barely afford treatment but prefer to spend what is left of the pay check for luxuries; and (3) those on a subsistance level or below who cannot pay for service no matter how well educated.

Meager statistics show that under 25 per cent of the population ever get any dental service other than an occasional tooth extraction for the relief of pain; yet it is known that a far larger per cent are financially able to provide at least adequate control service for their children. It is that large middle group who provide a fertile field for the dental health educational program.

Most of our endeavors in the field of public dental health have been confined to the educational phase. The reasons for this are obvious—it is the

* Read at a Joint Session of the American School Health Association, and the Maternal and Child Health Section and the Oral Group of the American Public Health Association at the Sixty-eighth Annual Meeting in Pittsburgh, Pa., October 18, 1939.

easiest and costs much less money. As a consequence many of our programs are educationally top heavy. It appears that the time has come when all health workers must give more attention to the service side of the dental health program even though the road be rocky and fraught with difficulties.

Sooner or later some solution must be found for meeting the dental needs of that large group of dentally indigent who are not at present securing any dental care. There is a growing public demand among these people that means be found to meet this need.

It is obviously futile to carry on extensive campaigns of dental health education among these people, to discover and rediscover dental defects among their children, yet provide no means for their correction.

That clinical dental service furnished by official and nonofficial organizations is inadequate is shown by a number of surveys. Two of these reports [1, 2] show that the state departments of health and education employ 65 full-time and 36 part-time clinicians, while the 326 cities of over 25,000 population employ 178 full-time and 437 part-time clinicians, a majority of whom are employed less than one day per week. In almost every instance the service is limited to the dentally indigent of the school age group. These surveys do not include the dentists employed in smaller communities or by volunteer or other unofficial agencies. There probably are not over 1,000 in this group. We know there are about 25,000,000 children of school age in this country and that about 20 per cent of them fall into the dentally indigent class. This means there are roughly 5,000,000 children of school age alone, eligible for public supported dental service.

An estimate of the number of dentists providing whole and part-time service to this one group would be around 2,500. This would mean over 2,000 patients per dentist, a large majority of whom are employed less than half-time. In a few urban areas there are a larger per cent of dentists than this. In most of the smaller communities there are less or none.

Data collected for the Health Facilities Study of the National Health Inventory have been used by the Public Health Service to evaluate some features of public dental services. Mountin [3] and his group selected 1,861 health agencies, official and nonofficial, in 94 widely separated counties for this purpose. This study shows that all agencies in the 94 counties provided 817 individual services per 1,000 school children. Indirect services, such as examinations and prophylaxes accounted for half of these.

A survey of the current needs of the school children of these 94 counties is not available. However, if we apply the data obtained by the U. S. Public Health Service in Hagerstown, Md.,[4] on 4,400 school children as an index, we can approximate the percentage of needed essential services, such as fillings, being provided for this group. In Hagerstown it was found that the average child had 7.5 carious tooth surfaces needing fillings alone. If this average is applied to the total school population of these 94 counties and related to the performance of their health agencies, the resulting calculation suggests that such agencies place only about 3 per cent of the estimated fillings required. Based on service for indigent children, only 15 per cent of the need is provided, if we can assume that 20 per cent of the total school population falls in that category. These figures are estimates but indicative of the manner in which all health agencies in 94 predominately urban areas are meeting the problem of dental care for needy school children.

This study also shows that 4 times as many children in counties of over

500,000 population received service than did those in counties under 40,000.

In a study [5] of similar nature among 9,000 widely distributed families of all economic groups, Collins found a disparity in the frequency of dental service between urban and rural groups. Children in cities of over 100,000 population between the ages 5 and 19 received twice as many fillings as did the same group in rural areas.

On the financial side of the picture the study made by Mountin in the 94 counties shows that all agencies which provided some measure of dental service spent 2 per cent of their total operating budget for the employment of dentists. Health departments in these counties spent 1 per cent of their total budget for this purpose.

There are other complexities in the establishment of adequate dental service, one of these is the uneven distribution of dental practitioners. A study of this situation will show too many of them crowded in centers of population, with thousands of the smaller communities without dentists. At the census of 1930, each dentist in the country served an average of about 1,700 persons, but this ratio varied from an average of 1,290 persons per dentist in an urban state such as New York to 4,000 persons or more per dentist in the rural states of Alabama, Arkansas, Mississippi, and North and South Carolina. The disparity observed in recent surveys of urban and rural communities in the receipt of dental care indicates that inaccessibility of dentists in the rural areas is in part responsible for the greater neglect of dental needs by rural families.

In the solution of the dental problem in our rural areas, restoration of balance in the distribution of dentists is an important factor. The economic and professional rewards of dental practice in rural communities must be increased if the extension of dental care in our rural population is not to be impeded by insufficient dental personnel.

Many counties in the sparsely settled western states could not and never will be able financially to support a dentist, yet there are many people living there in need of dental service. These are problems challenging the health department and the dental profession that are not amenable to a public dental health educational program.

Certainly definite action is imperative to meet this situation. Unquestionably more public funds—federal, state and local—must be appropriated for this work. It may be necessary for health agencies to underwrite professional personnel at least temporarily if they are to be attracted to small sparsely settled communities. This can be done by assuring them a small income for caring for indigent children. Basically this seems to be a better plan than to have state employed personnel provide treatment in these areas. To accomplish a plan of this type it will be necessary for the state dental examining boards of some of these states to change their viewpoint on the matter of licensure.

While dental health activities have made rapid strides since the passage of the Social Security Act, the amount of funds and the number of personnel are entirely inadequate to cope with a health problem so widespread.

Health and education agencies are confronted, in this instance, with a problem difficult in other respects. If dental disease were as spectacular in its effect as poliomyelitis, if it killed directly and as quickly as pneumonia, the means for its control would long ago have been at hand. However, the public will not always be satisfied to neglect their teeth for the reason that decayed teeth will not directly kill or cripple.

The dental problem is so serious and universal it will take the concerted action of all health workers and edu-

cators if in this generation we succeed in materially reducing the high rate of tooth morbidity and mortality.

In the last quarter of a century health needs have changed to the point where the health department can no longer confine its activities to communicable disease control and environmental sanitation. In fact, it is no longer possible to draw sharp lines between prevention and treatment.

If the health department is to fulfil its responsibilities to the indigent members of society and the non-indigent in sparsely settled communities, it must provide facilities for adequate medical and dental care for these groups as well as for preventive services.

The full responsibility for the dental health program for the dentally indigent cannot be successfully met by practising dentists and the small number of dental personnel in health departments alone. The promotion of dental health is a true function of the health department. To be effective it will require the careful consideration and active participation of all health workers.

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Services for Crippled Children under the Social Security Act*

R. C. HOOD, M.D.

Director, Crippled Children's Division, Children's Bureau, U. S. Department of Labor, Washington, D. C.

SERVICES for crippled children are becoming a matter of increasing interest to public health officials and state health agencies. This, I believe, is borne out by the fact that there has been a noticeable trend to place the administration of such services in state departments of health.

In 1935 at the time of the passage of the Social Security Act there were only 12 states in which state-wide programs of services for crippled children were in operation. In 4 of these states the services were administered by the state health department.

By June 30, 1936, 18 of the 46 state programs in operation were administered by the state health department. By June 30, 1938, Alaska, Hawaii, the District of Columbia, and every state had designated an official agency for the administration of these services. By June 30, 1939, all of these states and territories had programs in operation.

At the present time the state agencies administering the state programs are as follows:

Health agency	26
Welfare agency	14
Crippled Children's Commission	5
Education	5
University Hospital	1

Since the enactment of the Social Security Act only one state has transferred the services for crippled children from a health department to another type of official agency.

A majority of the state health departments administering these services have established a division of services for crippled children.

In the first full year of operation of services for crippled children, Congress appropriated $2,850,000 for federal grants-in-aid to states. The Act provided that all federal grants must be matched with an equal amount of state funds. Some states have had difficulty in matching the full amount of the federal funds allotted to them. The increasing interest in the services is shown by the fact that in the fiscal year 1938, 32 states were able to match the full amount of federal funds available, while in 1939, 37 states were able to match the full amount available. Out of the funds appropriated by Congress, $20,000 must be allotted annually to each state and the remainder of the $2,850,000 is allotted on the basis of the number of crippled children in need of care and the cost of providing care. Out of the total annual appropriation, $400,000 is reserved each year for allotment to the states on the basis of additional need. This year the requests received from this fund amounted to $800,000 or twice the amount available.

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On May 15, 1939, reports from state agencies showed 13,000 children on state registers in need of care, due to lack of funds. In recognition of this need and the requests for additional funds, Congress in August, 1939, authorized the annual appropriation of $1,020,000 additional funds for services for crippled children and included provisions for an allotment to Puerto Rico. The Deficiency Appropriation Bill included half this amount for grants during the present fiscal year. This money is not required to be matched by the states. Of this additional amount, $240,000 has been allotted to the states on the basis of population under 21 years of age, sparsity of population and average income; $50,000 has been allotted on the incidence of poliomyelitis; and $200,000 has been reserved for a beginning in services for children suffering with heart diseases. The basis of the allotment for children suffering from heart disease is under consideration at the present time.

The growth in interest in the crippled children's program is shown in the activities reports received from state agencies. At the end of the calendar year 1936, there were approximately 97,000 crippled children on state registers as compared with 224,000 at the end of the fiscal year 1939.

At the beginning of the fiscal year 1939, there were 4,225 crippled children under care in hospitals; and 1,372 under care in foster and convalescent homes. There has been a marked increase in the use of foster and convalescent homes during the past year.

During the fiscal year just ended, over 193,000 visits were made to clinics for diagnosis and treatment; over 40,000 admissions to hospital care; about 5,000 to convalescent home care; and about 2,000 to foster home care.

During this same period, over 194,000 home and office visits were made by public health nurses; 250,000 visits were made by physical therapy technicians; and an increasing number of children were given medical social work services.

For the year just ended, crippled children were seen at 296 permanent and 572 itinerant clinics. Five hundred and forty-five hospitals were used for the care of crippled children; a majority of which were private institutions. Eighty-eight per cent of these institutions were approved by the American College of Surgeons.

Detailed reports of the personnel employed under the program are not available as yet for the fiscal year 1939. It is interesting to note that during the previous year over 800 surgeons and 655 other physicians as consultants, such as plastic surgeons, ophthalmologists, pediatricians, oral surgeons, and others, were employed, with a comparable number of public health nurses, medical social workers, and physical therapy technicians.

Increasing attention has been paid during the past year to that large group of crippled children not in need of hospitalization and operative care. It is estimated that this group constitutes 75 per cent of the total number of children seen at the average diagnostic clinic. The increase and improvement in field services given by public health nurses, medical social workers, and physical therapy technicians has made it possible to reach more of this group and to care for conditions that do not require hospitalization.

Professional training at recognized training centers has continued during the past year. In 1938, 173, and in 1939, 108 persons were given additional training in public health nursing, medical social work, or physical therapy.

State agencies are continuing postgraduate educational courses for local practising physicians in the early diagnosis, prevention, and treatment of

crippling conditions. In 1938, 23 states included such provisions in their plans.

The standards for professional personnel have been maintained and improved during the past year. Sixty per cent of the orthopedic surgeons employed under state plans are either eligible for certification, or are certified by the American Board of Orthopaedic Surgeons. State agencies are increasingly using the American Boards of Certifications in the employment of consultants in other fields.

The recommendations with regard to public health nurses, medical social work, and physical therapy technicians made by the National Organization for Public Health Nursing, the American Association of Medical Social Work, and the American Physiotherapy Association, respectively, are increasingly being used by state agencies as a basis of requirements for the employment of professional personnel.

There has been a noticeable broadening of the scope of services. The services have been extended beyond diagnosis and operative care to include systematic and continuous case finding, registration, establishment of clinics that combine diagnosis and some forms of treatment, more complete general physical examinations, improved case records, more detailed instructions on discharge from hospitals, increased foster and convalescent home facilities, and improved after-care services.

One feature of the program deserving special notice is the increase in interest in the quality of care children are receiving. Several states are systematically reviewing the quality of care through qualified consultants; some are planning to employ out-of-state consultants for this purpose. This interest is a healthy sign that the state agency feels a responsibility for providing only the best care available to crippled children in the state.

Coördination of Educational Programs of All Health Workers*

REBA F. HARRIS, F.A.P.H.A.

Associate Director, Bureau of Public Health Education, State Department of Health, Louisville, Ky.

MOST health workers now in official public health departments have been allied with other professions or organized groups. Many health officers have been private practising physicians. The public health nurse was trained originally for private duty. Some public health engineers were at one time in the commercial field, and most of the health educators have been teachers, publicists, or commercial advertisers.

Influenced by his training and experiences in the first profession, each worker came into public health with his own interpretation of the philosophy, the principles and technics of promoting and safeguarding the health of the public. Each individual brought with him a program of work, formulated usually on a national basis, by his first group.

The extent to which each worker hangs on to his "first loved profession," is evident by the articles he writes, the reference books he keeps on his desk, his membership affiliations in organizations, and the periodicals to which he subscribes.

For example, one finds many public health nurses who read their journals on nursing but who do not subscribe to or read the *American Journal of Public Health.*

Each individual, whether he be doctor, nurse, engineer, or teacher, who enters the field of public health, soon expresses his strong conviction that the basis for public health work is education. "We must educate the public," is a catch phrase repeated by all. Immediately each worker assumes the rôle of an educator. It seems never to occur to him that education comes from within the human organism in accordance with specific laws in the science of human learning, and that education has certain principles upon which to base its technics. He begins his so-called "educational program," therefore, as he was taught in the public school, the university, and the hospital. To him education is *telling.* It is something to be applied from without by one person—usually a specialist—to large groups of people. "We can control syphilis only through education," said a physician newly appointed to a health department. "In less than a year I've educated over 50,000 people through talks and lectures." One needs only to read the monthly or annual reports of the health departments or individual health workers to find that this opinion is more or less universal. In such reports under the heading, "Edu-

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cation," we find a summary of so many hundred talks given, so many thousand pieces of literature distributed, so many moving pictures shown, and so many broadcasts given. So, we find public health workers clinging not alone to their "first loved profession" but also their early impressions of what constitutes teaching or "educating the public." This includes the health educator, for many such workers in this phase of public health may be observed in the paths of formal education or they may be developing a program with an overemphasis on the use of publicity tools.

With this patchwork quilt of personnel within the public health profession, which finds itself a combination of medical science and education, is our problem one of coördinating all of these highly individualized so-called "educational programs," or one of working out together a new program of public health education? Many good things have come from the trial and error methods of the public health nurse who never heard of the laws of learning. Communicable diseases have been prevented and controlled and lives have been saved by the dictatorial police methods of the health officer. Food establishments have been cleaned, milk supplies have been made safer, and sanitation laws enacted under the rigid inspection of the sanitarian. The tools of publicity and propaganda, which have been used by all public health workers, have played an important part in arousing interest in higher standards of living. These devices have been instrumental in bringing about many changed behaviors on the part of individuals and groups. On the other hand, when we look honestly at many situations surrounding us in reference to sanitation, inadequate housing, self-medication, the use of psuedo-medical services, the lack of medical and hospital facilities, the blind following of commercial advertising, and the increasing number of patients in mental hospitals, thinking persons should begin to question our future methods of educating the public into ways of better living.

So, in this brief analysis of the situation in reference to the quality of public health education, it is not our desire to be critical of past efforts, nor do we wish to leave the impression that all public health education should be placed in the hands of highly trained health educators. We believe that every person engaged in any phase of public health work—the public health officer, the public health nurse, the public health engineer, the nutritionist, the mental hygienist, and the office clerk—should feel that it is his or her responsibility to educate or guide the public into ways of healthful living. Our plea is that every public health worker, regardless of his background, his previous training or experience, should gain some understanding of the basic laws of human learning and keep abreast with the newer principles and technics of education to the same extent that he attempts to move forward on the basis of medical research. Just as the public health nurse turns to the medically trained physician for an interpretation of medical science, so she should seek also, the specialist in education for an understanding of the educative process.

As we all know, in the laboratories of medical science, new discoveries are brought forth almost daily. Many of these findings, of necessity change the technic of diagnosis, treatment, and prevention. The same thing is true of education. In the laboratories of real children—the nursery school, the kindergarten and experimental groups of older children and adults—research is gaining a better understanding of how children and adults learn, how they grow, and how they develop toward maturity. From these studies, we are beginning to discover the influences

which block or retard the learning process. Teaching technics are changing to meet these new findings. For example, with the research of Willard Olsen,[1] concerning physiological patterns of growth in relation to learning; with the research of Beth Wellman,[2] in relation to environmental experiences and learning; with Thorndike's contribution to adult learning, and with the research of the Progressive Education Association concerning growth and adjustments in adolescence, technics or methods of educating the school child and the general public in ways of better living must of necessity be different from our earlier methods.

It seems to me therefore, that we, in the field of public health need to work out together a new pattern of public health education. Let us look at the characteristics of such a program based upon the science of learning. Would it interfere with the medical technics of the services of the health officers, the nursing technics of the public health nurse and the technics of the sanitary engineers? Such a program would utilize the service-technics of each individual health worker as powerful aids for guiding the public into ways of healthful living. The foundation of this program is services rendered in an educative way by all public health workers.

"Every immunization given, every water supply installed or improved, every toilet built or changed, even the technic of sterilizing the needle, and the mechanics of keeping records, should not be ends in themselves but convincing arguments for better living," says Dr. Felix Underwood, State Commissioner of Health of Mississippi. We would add that every health examination given a school child, every conference with parents, every clinic service, every visit to a home, every contact with community leaders in civic or professional clubs should be conducted in such a manner that these individuals or groups will gain a better understanding of the values of preventive measures in everyday living.

These services can be rendered in an educative way only to the extent that health workers understand the learning process and are able to locate influences which may retard or block the learning of those to whom services are given. What provisions can be made for making more effective all of our efforts toward educating the public into more healthful ways of living, with a program of education based upon the service point of view? There are three fundamental steps which may be taken by any local health department group that has a sincere desire to merit its leadership in any community and whose members are willing to discard old patterns of early professional training and keep abreast with the new.

1. Set up a plan whereby each public health worker—doctor, nurse, engineer, technician, clerk and health educator, may be guided to understand better the *philosophy* of public health in relation to our social structure as a whole.

2. Include in this plan provisions for the same individuals to secure help and guidance in understanding the sciences of human learning and the principles of education as they relate to the public health services.

3. Provide opportunities for the guidance of all workers to evaluate their present activities and methods of health education in terms of the basic philosophy of public health and learning process of human beings.

These three steps may be used as the basis for staff conferences, study groups, and meetings composed of *all* workers, including the administrative director and the office clerks. Such conferences cannot be held with effective results by nurses meeting separately from the health officers, sanitary engineers, and other personnel of the department. Just as the health department group has found ways and means of studying more about the prevention and control of syphilis or pneumonia,

so they must study the most effective way of educating the people of their community. Institutes, summer school courses, and the use of the consultant in education should be used freely.

Under the first step—that of gaining a better understanding of the philosophy of public health in relation to the social structure as a whole—each group should discuss freely the viewpoints of various leaders on the question—"Toward what direction is public health moving, regardless of present-day confusion, inadequate finances, and federal consolidation?"

The Committee on Administrative Practice of the American Public Health Association,[3] has stated very simply a broad viewpoint toward which they believe public health is moving in the social structure of today. I quote a digest of two paragraphs of this report. I have changed the words "health officer" to "health department." A digest of the Committee's statement is as follows:

> Official public health departments, a unit of state, city or county government, once were content to deal only with the most urgent sanitary needs of the environment, and with the most pressing problems in the control of communicable diseases. The modern health departments have an obligation to educate the public in ways of healthful living and in the prevention of infant and maternal deaths. It is now recognized that the responsibilities of these departments go even further, for public health involves the early diagnosis of diseases which are at best only partially preventable, and which, in the past, have not been dealt with on a community basis. For the prevention of such diseases, it is the function of the public health department to see that the community is provided with personnel and facilities whereby early diagnosis can be followed by prompt and adequate professional care. The increasing complexity of social forces and their effect upon the health of individuals focuses attention upon diet and nutrition, upon housing, upon opportunities for recreation and upon social and economic factors generally, which exert profound influence upon health.
>
> Though the modern health department has wider opportunities than its predecessor, this does not mean that the department or the local government must necessarily assume responsibility for providing all the services which come within the field of health interest or health needs of the general population. It does mean that the health department has broad responsibilities to survey the health conditions of the community, to measure its health needs, to ascertain the extent to which the community is supplied with necessary personnel and facilities, and to participate in the formation of practical plans—appropriate to the communities' needs and means—to assure that adequate personnel and institutions are available in the community. On this basis the health department becomes the unit of local government chiefly responsible for planning, whether the service is to be administered by the health department or by other agencies, public or private, organized or unorganized, collective or individual.

With the acceptance of such a philosophy not only will there be changes in the technics of public health nursing and in our present methods of educating the public, but all other phases of public health will be brought into true focus. Health officers will see that they cannot continue to carry their earlier hospital attitudes toward nurses as subordinates, for public health is a cooperative adventure to be coöperatively planned by every member of the department. If the health department is to become a "unit of local government chiefly responsible for planning" to meet the health needs of a community, the staff of professional health workers must first learn how to plan coöperatively within their own ranks.

The second step for improving our efforts toward educating the public into more healthful ways of living, namely that of securing help in understanding the *laws* of *human* learning and the newer technics of education as they relate to public health services, will follow logically after the group's acceptance of a broad philosophy. For each group will feel a need for such understanding and will begin to formulate its plan for learning more about the newer procedures in education.

In the State of Kentucky it has been my privilege, as an educator on the staff of the State Department of Health, to work coöperatively with public health nurses and all other public health workers on an educational basis. We have set up a state-wide plan for continued learning or in service education for workers on the administrative and field staffs of the State Department of Health and the personnel of the 89 coöperating county health units.[4]

In the small study groups, which form the basis of this plan, the programs each year have been organized upon the principles of education. Discussions and demonstrations have taken place in these study groups in reference to the laws of the human learning. It has been our belief that the first responsibility of the health educator is to help all public health workers to become better educators. We believe that services rendered by a health officer, a public health nurse, or a sanitary engineer *in an educative way* are more effective than all the words, visual aids, or unrelated activities of the health educator.

The third step, that of evaluating our services and present practices in terms of a philosophy of public health and the learning process, is easier said, perhaps, than its actual accomplishment. A ready-made plan or device cannot be set up for this evaluation. The methods of evaluation can come to a group only through its understanding of the philosophy of public health and the principles of human learning.

For example, when a nurse understands that a classroom teacher and a group of children, or a mother in the home will carry out more effectively any activity for which they have had a part in the planning, the nurse will question her ready-made plans which in the past she has formulated alone. We believe it is the function of health educators, as well as directors and supervisors of nursing service to guide nurses to learn *how to think,* rather than give them ready-made plans and devices of *what to do.* When the public health nurse is working with a family or a group she must keep her eyes open to the existing situations which may be the cause of many health problems. She must, of necessity, be making decisions and adjustments in order to guide the patients to meet their own health needs. Memorizations of routine outlined technic does not build for flexible change. In our very close association with public health nurses during the past five years, we have found that as soon as a nurse learns *how to think, how to question,* and *evaluate* her own services, she will find for herself new ways for old methods.

Much has been said and written these past few years on the subject of evaluating the health teaching of public health nurses and other public health workers. The national study, made by your own nursing group, is often quoted. We are wondering if most of these studies have missed the mark of true evaluation. Some of us are counting the number of lives saved, instead of the fate to which we save them; some of us are counting the activities of the public health workers, the number of clinics, the talks, the visits, and the literature distributed, instead of the changed behavior on the part of those to whom service is given; some are recording what the *nurse does* and what she *tells* the patient in home visits, rather than the questions which the family ask and the changed living in that home as a result of the nurse's visits *over a period of time;* some of us are checking health knowledge and the routine following of health habits, rather than evidence of intelligent living of individuals and groups.

It seems to me that true evaluation of public health education should be based upon growth in learning, which

will manifest itself in the increasing number of persons who learn how to think and how to live intelligently in a coöperative society. Under this view of evaluation, we will look for a decrease in physical defects of school children and not our present vicious circle of finding and correcting defects. Thinking parents will prevent the development of many of these defects in the prenatal and preschool periods. We will look for a decrease in the number of uninvited home visits of the public health nurse, for thinking parents will seek medical and nursing aid because they know its value. We will find an increasing number of private physicians practising preventive medicine, for thinking physicians will give this service at the request of thinking adults who seek it.

This type of evaluation may appear visionary and academic but the three volume report of the Hearings before the Sub-Committee on Education and Labor in the United States Senate,[5] in reference to the bill to establish a National Health Program, indicates clearly the need for a different type of evaluation, as well as a different type of educational program. The public has been aroused and awakened to the need for medical science in individual and group living for *all* people. Our past evaluations of services rendered have been based largely upon our efforts with the lower one-third of the nation's population.

SUMMARY

In summary, may we state that because public health is a combination of medical science and education, and because so many workers have entered the field of public health from other professions, all of us need to gain a united concept of the philosophy of public health and the principles of human learning in a changing social order. Public health nursing can no longer stand alone as a separate organization or profession any more than public health can be segregated from medical science. Public health nursing must become an integrating force within the science and art of public health.

Our problem is not one of coördinating the existing educational program of all health workers. It is a problem of working out together a new program of public health education which is based upon service rendered in the educative way by every public health worker.

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A Study of an Epidemic of Brucellosis Due to Brucella Melitensis*

I. FOREST HUDDLESON AND MYRTLE MUNGER

Department of Bacteriology and Hygiene, Michigan State College, East Lansing, Mich.

DURING a period extending from December 10, 1938, to February 10, 1939, there occurred at the Michigan State College, 45 clinical cases of brucellosis, of which one terminated fatally. Of the total, 41 were college students, one a laboratory stockroom attendant, one a plumber, one a stenographer, and one a salesman.

This report deals chiefly with an analysis of apparent conditions that were investigated to determine the source of the infection and the results of laboratory diagnostic tests made on the clinical cases and other individuals thought to be directly involved.

Not until most of the clinical cases of the disease had occurred and their location with respect to each other in residence and in college courses prior to and during the epidemic established, was it possible to suspect a probable center where exposure to infective material might have taken place.

The search for the source of the infection was considerably narrowed due to the fact that only *Brucella melitensis* was isolated from the blood of the cases. This species has never been recovered from an animal source in this territory in recent years, and furthermore, all milk used by the students at the college is pasteurized.

A positive diagnosis of brucellosis was established from the combined results of the Brucellergen skin test, the agglutination test, the phagocytic test, and blood culture.

The onset of the first case was on December 10, 1938. A positive diagnosis was made by laboratory tests on December 20, 1938. The individual in question was employed as a student assistant in a laboratory of the bacteriology building located near the *Brucella* laboratory. Since several cases of brucellosis have occurred in past years in individuals directly associated with brucellosis investigations, the occurrence of infection in this individual was not considered as unusual. On January 7, 1939, a second case was diagnosed as brucellosis by blood culture and other laboratory tests. The date of onset was December 27, 1938. This individual, a member of the faculty, had taken a laboratory course in bacteriology during the fall term extending from September 26 to December 23, 1938. During the second week of the winter term, from January 5 to March 24, 1939, several students who had become ill during the Christmas vacation or shortly after they returned to the college campus, entered the college hospital for observation and treatment. A diagnosis

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of brucellosis was made within 24 to 48 hours after entry. Three students who became ill at home during the last week of December were unable to return for the second term. A diagnosis of brucellosis was made by their local physicians.

The investigation revealed that 21 of the clinical cases were in students enrolled in the veterinary division; the others were enrolled in either the science, the agricultural, the home economics division, or the graduate school. It was also found that a majority of the cases, regardless of their divisional classification, were more closely associated together at the same time in 3 of the 15 laboratory classes in the bacteriology building than in other classes in other buildings during the fall term.

During the fall term there were 369 students taking laboratory courses in one or the other of the 11 sections of bacteriology, one of the 3 sections of parasitology, or in poultry hygiene. There were also about 350 students taking one or more lecture courses in bacteriology during the fall term. The laboratory courses in bacteriology were divided into one or more sections of 2 hour periods held either 3 or 5 days of each week. The bacteriology and parasitology laboratory classrooms were located on the second and third floors of the building. The course in poultry hygiene was held in the basement floor annex of the building. All but 2 of the clinical cases among students had taken one of several laboratory courses in the bacteriology building during the fall term of the college year. One of the 2 exceptions was a student laboratory assistant working in a laboratory on the basement floor near where the *Brucella* investigations are housed. Another had visited one of the two student laboratories on three occasions during the fall term. He stated emphatically that he neither drank water nor washed his hands while in the laboratory. The stockroom attendant was in charge of the student laboratory supplies room located on the second floor of the bacteriology building. The plumber installed an autoclave on the first floor of the bacteriology building during the third week of December. He also worked in the basement while connecting the steam line to the autoclave. The stenographer was located in a small library room on the first floor of the bacteriology building. She was in the habit of making daily visits to the *Brucella* laboratory located in the basement of the bacteriology building. The salesman called at the office of the stenographer just mentioned on December 13 just long enough to leave advertising matter. At this time he visited no other part of the building. He again visited the same part of the building on January 2 for only a few minutes.

As soon as it became apparent that an unusual number of students were affected, that the infecting organism was *Brucella melitensis,* and that all the students, with 2 exceptions, had taken one of the laboratory courses in the bacteriology building, a survey was begun of all students who had taken laboratory courses in bacteriology and parasitology to determine whether the exposure had centered around any of these classes. Previous studies have already revealed that the results of the Brucellergen skin test, agglutination test, and the phagocytic test often reveal what might be termed "latent" or subclinical infections in groups of individuals who, at the same time, are exposed to infective material, which gives rise to clinical infections. In addition to the above named tests, a blood and throat culture was made on as many students as possible, beginning the second week of January and extending to the first week of February. The results of the laboratory tests on all students who were examined are pre-

TABLE 1

Incidence of Brucellosis in Students According to Day and Hours Present in Laboratory

Class	Sec.	Day and Hours in Class						Students			
		Mon.	Tues.	Wed.	Thur.	Fri.	Sat.	Total	C.I.*	S.C.*	Not Tested
201b-304	2	3- 5	3- 5	3- 5	3- 5	3- 5		40	11	12	4
201b	2		10-12		10-12		10-12	20	0	2	2
201b	3	10-12		10-12		10-12		33	14	13	0
201b	4	1- 3		1- 3		1- 3		37	0	1	12
201b	1		8-10		8-10		8-10	9	0	3	0
304e	..	1- 3		1- 3		1- 3		24	2	3	6
201b-304	1	8-10	8-10	8-10	8-10	8-10		28	7	6	2
304a	2	10-12		10-12		10-12		26	0	0	0
304a	1		10-12		10-12		10-12	8	1	0	0
304c	..		1- 3		1- 3		10-12	10	0	0	0
201a	5	3- 5		3- 5		3- 5		21	0	0	0
P306	1		2- 5					27	0	0	4
P306	2			2- 5				23	3	6	2
P306	3				3- 6			43	0	0	1
Total								349	38	44	33

* C.I. = Clinical infection
* S.C. = Subclinical infection

sented in Table 1. The results show that most of the clinical and subclinical infections were confined to 3 laboratory classes in bacteriology held on either the second or third floor. The 3 cases in one section in parasitology were also taking poultry hygiene.

Since the results of the laboratory tests indicated that the bacteriology building was the focus from which the cases originated, each possible way in which the infective material might have reached the individuals was investigated. The findings of the investigations which were conducted in cooperation with members of the State Department of Health, follow:

1. *Laboratory experiments*—There were no cultures of *Brucella* or materials containing *Brucella* issued to students in any of the laboratory classes during the fall term. No cultures of *Brucella* were used on the first, second, or third floors of the building during this period.

2. *Contact with the Brucella laboratory*—Only one of the clinically infected students had ever been inside the *Brucella* laboratory, and only a small number of the cases had ever been on the basement floor where this laboratory is located. Two of the students in one of the classes in which several cases occurred were employed a few hours each week in the *Brucella* laboratory and laboratory tests made early in the fall term showed that they were immune to *Brucella* infection. The *Brucella* laboratory (B. Fig. 1) was not a completely closed unit. The 37° C. room used by the laboratory was located off of a hallway in the basement. Used glassware, often containing live organisms, was carried in closed containers to a washroom (D. Fig. 1) located in the annex to the basement to be sterilized, washed, and processed for further use. The students in the class in poultry hygiene and the student assistant, who was the first one to develop clinical infection in December, were the only ones who were in or close to the washroom.

An inclosed Sharples centrifuge which was used for centrifuging live *Brucella* organisms was located in the hallway of the basement. The centrifuge had been used for this purpose more than 100 times since 1929. The last time *Brucella melitensis* was centrifuged before the epidemic, was in the second week of November, 1938.

3. *Contamination of water supply from sewerage*—The water from faucet openings in the bacteriology building has been examined at intervals for several years by Dr. W. L. Mallmann. At all times the bacterial count has been low and it has been free from fecal contaminating organisms.

4. *Contamination of water supply from back siphonage*—The possibility that back siphonage from a sink in the *Brucella* laboratory or from the basement washroom might have been the means by which the students became infected was considered from the beginning. In order to prove such a hypothesis, one must actually produce siphonage from a sink under average working conditions. One must also show that the procedure of washing glassware in the washroom

would permit siphonage when and if a negative pressure existed in the connecting cold water line in the building. Furthermore, one must prove that the glassware and culture media containing live organisms was not sterilized before washing.

R. J. Faust, Sanitary Engineer for the State Department of Health, after many trials succeeded in producing siphonage of water colored with fluorescein through the cold water faucet at the basement washroom sink and into the main water line passing backward through the south side of the basement.

The water supply to the building entered the basement at 1, Fig. I. The pipe extended through the entire length of the basement of the washroom D located on the south side of the building annex. The faucet opening at the washroom sink was located 2 feet higher than those located in laboratories in the main basement. The water supply to the *Brucella* laboratories, to a lavatory, and two research laboratories on the first floor of the building was carried through a common pipe off of the main line. Water for the third floor student laboratory was obtained through two vertical extensions connected at 2 and 6. Extension 6 was a small pipe and also carried water to a small research laboratory on the first floor. The second floor laboratories obtained their water supply through a vertical pipe extension connected at 5.

Back siphonage was accomplished only by completely closing the valve of the water main where it entered the building at I, and at the same time closing all water faucets on the first, second, and third floors of the building. While the valves just mentioned were closed, a rubber hose was attached to the washroom cold water faucet, SD, and immersed in a basin of water containing fluorescein. The faucets in the basement laboratories A1, A2, and A3 on the south side of the building and directly off of the main water line were then opened, thus permitting the water in the main pipe to drain out. The emptying of the main pipe established a negative pressure at the washroom faucet and when opened, back siphonage occurred. After fluorescein water had collected in the main water line running through the basement, all basement faucets, including the one in the washroom D, were closed. The main valve to the water line entering the building was then opened. When the water faucets on the upper floors were opened, the water pressure in the main line forced the fluorescein water upward and out through faucets on the second floor laboratories and one on the first floor laboratory fed through pipe 6. Not until a valve in feeder pipe 2, leading to the third floor was closed, was it possible to force fluorescein water through feeder pipe 6, up to the third floor student laboratory. At no time during the siphonage experiment, however, or after the water pressure was restored, was there any fluorescein water obtained from the faucet openings located on the north side of the basement floor in the *Brucella* laboratory, or those extending to the first floor at 3 and 4.

It is obvious from the foregoing description that the production of experimental siphonage in the bacteriology building was a complicated procedure which required considerable time and thought.

If siphonage of water containing live pathogenic organisms from the washroom sink had occurred at some subsequent time unknowingly, the following conditions would have had to exist at or near the same time:

1. Valve I of the water main entering the building turned off.
2. The valve of the vertical extension at 2 turned off.
3. All faucets on the upper floors closed.
4. One or more faucets in basement laboratories A1, A2 and A3 opened.

KEY TO FIGURE I

A1, A2, A3, A4, A5. Research laboratories
B. Brucella laboratories
C. Animal room
D. Washroom for basement glassware
E. Storage for glassware
F. Icebox
G. Storage
H. Hall
I. 37° C. room
K. Sharples centrifuge
S. Sink

1. Water line entrance to building
2. Water line extending to third floor student laboratory
3. Water line to first floor lavatory
4. Water line to first floor laboratory
5. Water line to second floor student laboratories and washroom
6. Water line to first floor laboratory and third floor student laboratory
7. Faucet outlet for watering experimental animals

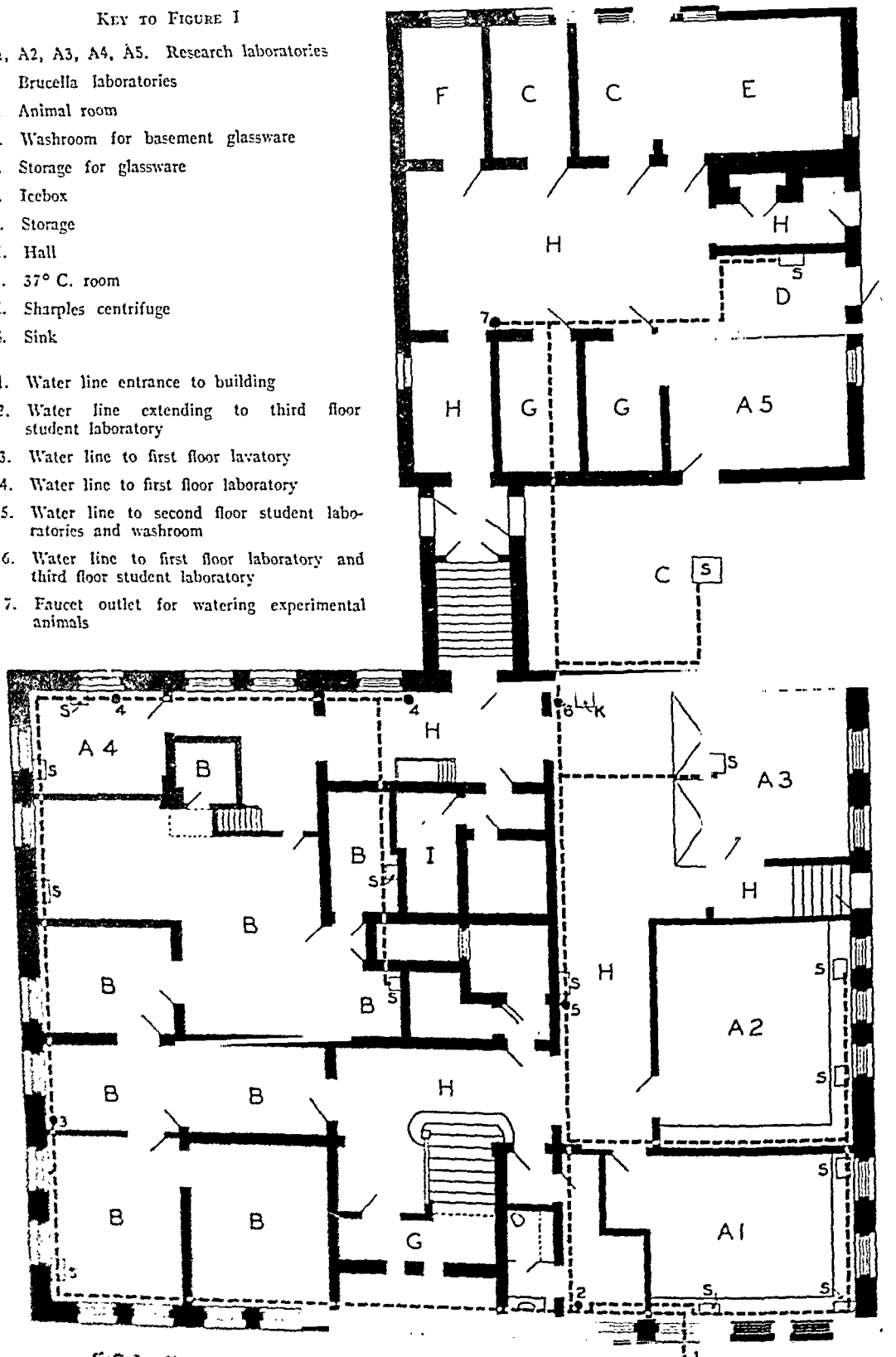


FIG. I - BASEMENT FLOOR PLAN OF BACTERIOLOGY BUILDING

5. A rubber hose attached to the faucet in the basement washroom, and the hose extended under water containing the washings from unsterilized glassware; the faucet being opened shortly after the other water faucets were opened in the basement.

6. The glassware containing *Brucella* organisms not properly sterilized before placing in the sink.

The information which was obtained from the plumbing department of the college and from the woman who washed the glassware failed to furnish any evidence on which one could conclude that point (1) or (5) ever existed. The superintendent of the plumbing department stated that the water main valve to the building was never turned off during the fall term. An extension hose had never been used on the cold water faucet and, due to the difference in size of the hose and faucet opening, the woman attendant demonstrated in the presence of several individuals that she was unable to slip the hose over the faucet opening.

Point (6) was thoroughly investigated by the authors. It was found that when the copper boxes used for collecting discarded glassware were packed to capacity with Petri plates and test tubes containing liver agar cultures, covered and placed in flowing steam, all *Brucella* cells were not killed at the end of 30 minutes, but were after 1 hour. All of the agar medium in the Petri plates was not completely liquefied at the end of 1 hour. It is not necessary that the temperature be raised to the liquefaction point of 2 per cent agar medium in order to kill *Brucella*. In view of the fact that the sterilization and washing of the glassware from the *Brucella* laboratory was not always closely supervised, it is possible that at times adequate sterilization was not practised.

There remains still another important question that must be answered in the affirmative before one can prove that live *Brucella* organisms were siphoned into the main water line of the building during the fall of 1938 or at any other time. The question is, were there any unexplained *Brucella* infections in the normal stock of guinea pigs and rabbits that were housed in a room near the washroom in question during the fall and winter of 1938? Approximately 150 normal guinea pigs and 20 rabbits were watered daily from a branch pipe leading from the main water line at 7, near the washroom and from which fluorescein water was obtained during the siphonage experiment. Since guinea pigs and rabbits are easily infected with *Brucella* by the oral route, one would expect to find a considerable percentage of them infected if they drank water which contained a sufficient number of *Brucella* organisms to infect human beings. That this situation never existed was established by negative findings in all the normal stock of guinea pigs and rabbits when examined for *Brucella* infection during the months of February and March, 1939. It might be added that several thousand guinea pigs have been used in this laboratory during the past 24 years and have always received water from the same outlet. There is only one instance of infection occurring among the normal stock. This happened in 1920, when they were housed in the same room with experimentally infected guinea pigs.

The failure to find *Brucella* infection in the normal stock of animals and lack of any proof that the valve controlling the water main leading into the building was ever closed during the fall term would lend little, if any, support to the hypothesis that live *Brucella* organisms were ever siphoned into the water supply of the bacteriology building during the fall or winter months of 1938, prior to the brucellosis epidemic.

Contact transmission—There is circumstantial evidence, but no positive proof that the epidemic might have originated from carriers and spread from one person to another as a result

of working or being associated together for a period of time. In order to prove that the infections arose as a result of contact instead of from one single source, it is necessary first to discuss and weigh all the evidence in favor of and against mass exposure to one particular source of live organisms over a period of one day, and that in favor of and against contact exposure extending over a period of several days.

The most convincing evidences in favor of mass exposure are: (1) all clinical cases had been in the bacteriology building during the month of December, 1938; (2) at least 35 of the 41 clinical cases in students had been in classes on either the second or third floor student laboratory for 2 hour periods during the same 3 or 5 days of the week. Now, if mass exposure occurred in the laboratories from a single source such as the water supply on one particular day, one should be able to show: (1) that clinical and subclinical cases occurred among members of all the classes that were present on that day, (2) that the majority of the clinical and subclinical cases were present in the same classes on the same day.

In order to show whether one or both of the conditions just mentioned existed, all students who were present in all classes in both laboratories on each class day of the week were grouped together and the total number of infections that occurred among those present on each of the days tabulated. The results of this tabulation are set forth in Table 2. If the 3 clinical cases which were taking both poultry hygiene and parasitology became infected while in the basement of the building, then 34 of the remaining 35 clinical cases and the majority of the subclinical cases were in the laboratories in one or three classes on the same days, namely: Monday, Wednesday, and Friday. The one remaining case, although scheduled for class work on Tuesdays, Thursdays, and Saturdays, was in the second floor laboratory on other days of the week as well. If mass exposure occurred in the laboratories on one day, the data in Table 2 would indicate that only Monday, Wednesday, or Friday could be considered. Now if the exposure occurred on one of the three mentioned days from the water supply, it is logical to expect and one should find some evidence of the exposure in all classes present on one of the three days.

TABLE 2

Incidence of Brucellosis in Students According to Total Number Present in Laboratory on Each Day

	8–10				10–12				1–3			
	Total	C.I.*	S.C.†	No Test	Total	C.I.	S.C.	No Test	Total	C.I.	S.C.	No Test
Mon.	28	7	5	2	59	14	12	0	61	2	7	18
Tues.	35	7	7	2	28	1	4	2	10	0	0	0
Wed.	28	7	5	2	59	14	12	0	61	2	7	18
Thur.	35	7	7	2	28	1	4	2	10	0	0	0
Fri.	28	7	5	2	59	14	12	0	61	2	4	18
Sat.	9	0	2	0	38	1	4	2	..	..	..	..

	3–5				3–6				Total No.			
	Total	C.I.	S.C.	No Test	Total	C.I.	S.C.	No Test	Present	C.I.	S.C.	No Test
Mon.	61	11	13	4	..	..	..	..	209	34	37	34
Tues.	67	11	16	8	..	..	..	..	140	19	27	12
Wed.	84	14	14	6	..	..	..	..	232	37	38	26
Thur.	83	11	15	5	43	0	2	1	199	19	28	9
Fri.	61	11	13	4	..	..	..	..	209	34	34	24
Sat.	..	..	..	..	..	..	..	..	47	1	6	2

* C.I. = Clinical infection
† S.C. = Subclinical infection

TABLE 3

Incidence of Brucellosis in Classes Present in Laboratory on Wednesday

Class	Floor	Hours	Total	C.I.*	S.C.†
201b-301	2	8–10	28	7	5
201b	3	10–12	33	14	12
301a	2	10–12	26	0	0
201b	3	1– 3	37	0	3
301c	2	1– 3	24	2	4
P301	2	2– 5	23	3	1
201b-301	3	3– 5	40	11	13
201b	2	3– 5	21	0	0
Total			232	37	38

* C.I. = Clinical infection
† S.C. = Sub-clinical infection

If the data presented in Table 1 and Table 3, relative to the total number of infections occurring in each class present on Wednesday, are examined closely, it is seen that three classes containing 84 students in which no clinical infections occurred, were present on each of the same three days when four classes, accounting for 34 clinical infections were present. Since no clinical infections occurred among the 84 students in the three classes on the three days, it is difficult to see how mass infection could have taken place on the same day in the other four classes from a source such as the water supply. Further, there is no relation between those infected and the floor of the building on which they were working.

There were 2 students enrolled in the veterinary division during the fall term of 1938 who were found to be affected with the chronic form of brucellosis in October, 1938. *Brucella melitensis* was isolated from the blood of both. The date of onset in one case was June 28, 1938, the other in July, 1938. One had taken a laboratory course in parasitology in the bacteriology building during the spring term, March to June, 1938. The other had taken no courses in the bacteriology building during the period just mentioned. The two students in question did not take any course work in the bacteriology building during the fall term of 1938. There was obtained no positive evidence that the 2 students in question were the source of infection in the large group of students.

During the epidemic there was found only 1 case in which the possibility of contact infection was indicated. All laboratory tests conducted on the student on January 27, 1939, were negative. On February 10, the student became ill and on February 13, was examined for brucellosis. All tests, including the blood culture were positive. Since the student was also among the members of one class in which several infections occurred, the infection may or may not have been transmitted by contact.

Before one can say definitely that the exposure to infective material occurred on one particular day, he must decide whether the case whose onset was on December 10 was exposed to the same source and at the same time as those that developed later. The fact that the type of organism involved in this case, as well as in the others, was *Brucella melitensis* would indicate that all were closely related. But since the dates of onset between the first and last case are so wide apart it is still a debatable question whether all were exposed at the same time and to the same source.

RESULTS OF THE DIAGNOSTIC TESTS

The circumstances and conditions under which the epidemic developed

made it possible to apply all known diagnostic tests to those involved, and furnished an opportunity to gain valuable information as to their value in aiding in the early diagnosis of brucellosis.

As quickly as cases were suspected on the basis of clinical symptoms and signs, a skin test was made with Brucellergen and blood was collected for the agglutination and opsonic tests, and for culture in Tryptose broth. The procedures used in conducting the tests have been described previously.[1] The same tests were made on most of the other students who were in the laboratory classes in bacteriology and parasitology during the fall term. The tests were made on the volunteer group as rapidly as possible between January 15 and 30, 1939. The results of the laboratory tests in 41 clinical cases, and 49 classified as subclinical are summarized in Table 4.

cases which at the time showed a maximum agglutination titer of 1:25. Data showing the interval between the date of onset and the date the agglutination test was made and titer obtained are set forth in Table 5. The intervals varied from 1 to 80 days. There does not appear to be any relationship between the strength of the titer and the time the test was made after onset.

The Brucellergen skin test was positive in all clinical cases. The size of the local reaction varied from 2 to 6 cm. The results of the phagocytosis test were confusing in 8 of the 41 clinical cases in that the phagocytic picture was similar to that observed in immune individuals. These results agree in many respects with the results of the phagocytic tests conducted on *Brucella melitensis* infected individuals on the Island of Malta. In many cases of *Brucella melitensis* infection most of the leukocytes in the patients' blood in

TABLE 4

Comparison of the Results of the Agglutination Test with Results of Other Laboratory Tests on 41 Clinical and 49 Subclinical Cases of Brucellosis

Total No.	*Clinical Cases 41*				*Sub-clinical Cases 49*			
Maximum Agglutination	*Neg.*	*1:25*	*1:50*	*1:100 or Higher*	*Neg.*	*1:25*	*1:50*	*1:100 or Higher*
Titers, No.	4	12	7	18	26	8	6	9
Blood Culture, Positive	3	12	7	13	1	0	1	1
Brucellergen Test, Negative	0	0	0	0	1	1	1	0
Brucellergen Test, Positive	4	12	7	18	25	7	5	9
Phagocytosis, Low or Moderate	3	10	6	14	16	6	4	7
Phagocytosis, Marked	1	2	1	4	0	1	1	2
Phagocytosis, Negative	0	0	0	0	10	1	1	0

The results of the blood cultures, the skin test, and phagocytosis test on each case are grouped together according to their maximum agglutination titers. Of the 4 clinical cases whose blood sera were negative to the agglutination test, 3 showed a positive blood culture on the same date. The blood examinations in 2 of the 4 cases were made 10 days and 7 days after onset and in one, 3 days before the onset. The blood culture was positive in 12 other clinical

a phagocytic system show a marked phagocytosis of *Brucella* cells. It is obvious from the results of each of the laboratory tests, that one cannot place too much reliance on any one test to confirm the early diagnosis of clinical brucellosis. The results of all the available tests taken together must be carefully analyzed in arriving at a positive diagnosis.

In considering the results on the group classified as subclinical cases, one

TABLE 5

Results of the Agglutination Test and Blood Culture on 41 Clinical Cases of Brucellosis

Case No.	Date of Onset	Date of Tests	Blood Culture	Maximum Agglutination Titer
1	12-10-38	12-20-38	—	[illegible]
2	12-19-38	1-30-39	—	[illegible]
3	12-26-38	3-17-39	Not taken	+ 1:500
4	12-27-38	1- 7-39	—	+ 1:[illegible]
5	12-27-38	2- 1-39	—	+ 1:[illegible]
6	12-28-38	1-13-39	—	+ 1:[illegible]
7	12-28-38	1-17-39	—	+ 1:[illegible]
8	12-28-38	1-27-39	—	+ 1:[illegible]
9	12-28-38	1-17-39	—	+ 1:50
10	12-28-38	1-12-39	—	+ 1:[illegible]
11	1- 5-39	1-13-39	—	+ 1:[illegible]
12	1- 5-39	1-23-39	—	+ 1:[illegible]
13	1- 5-39	1-24-39	—	+ 1:[illegible]
14	1- 6-39	1-25-39	—	+ 1:[illegible]
15	1- 6-39	1-13-39	—	[illegible]
16	1- 6-39	1-12-39	—	+ 1:[illegible]
17	1- 6-39	1-14-39	—	+ 1:[illegible]
18	1- 6-39	1- 9-39	—	+ 1:50
19	1- 7-39	1-12-39	—	+ 1:[illegible]
20	1- 7-39	1-23-39	—	+ 1:[illegible]
21	1- 8-39	2- 1-39	—	+ 1:[illegible]
22	1- 9-39	1-15-39	—	+ 1:[illegible]
23	1-10-39	2-14-39	—	+ 1:[illegible]
24	1-10-39	1-19-39	—	+ 1:[illegible]
25	1-12-39	1-14-39	—	+ 1:[illegible]
26	1-13-39	1-14-39	—	+ 1:[illegible]
27	1-13-39	1-20-39	—	+ 1:[illegible]
28	1-13-39	1-24-39	—	+ 1:[illegible]
29	1-15-39	1-16-39	—	+ 1:[illegible]
30	1-16-39	1-19-39	—	+ 1:[illegible]
31	1-19-39	1-24-39	—	[illegible]
32	1-20-39	1-24-39	—	+ 1:[illegible]
33	1-20-39	1-25-39	—	+ 1:[illegible]
34	1-23-39	1-28-39	—	1:[illegible]
35	1-25-39	2- 8-39	—	+ 1:[illegible]
36	1-30-39	1-31-39	—	[illegible]
37	2- 1-39	2-14-39	—	+ 1:[illegible]
38	2- 3-39	2- 7-39	—	+ 1:[illegible]
39	2- 5-39	2- 7-39	—	+ 1:[illegible]
40	2- 7-39	2- 9-39	—	1:[illegible]
41	2-10-39	2-15-39	—	+ 1:[illegible]

+ = complete agglutination or positive blood culture
— = no agglutination

must take into consideration the possibility that many of them may have been exposed to infection several months or years before the fall of 1938. The results of laboratory tests conducted on groups of students during the past several years reveal that from 10 to 15 per cent may have at one time been infected with *Brucella*. The results of the phagocytic test, however, in which only 4 of the subclinical group show a high phagocytosis, would indicate that not all of them were exposed to infective material on or near the same date as the clinical cases. Data which tend to confirm this view are shown in Table 1 from the clinical history of some of the subclinical cases. The largest number of subclinical infections were found there in the 3 days in which most of the clinical infections occurred.

It is interesting to note that a positive blood culture was obtained from each of the 4 in the group which showed the highest phagocytosis. In the 3 cases in which blood cultures were taken after exposure, the 3 cases showing positive blood cultures also showed a positive agglutination test, while those showing negative blood cultures showed no agglutination at the time the blood culture was taken. The 4 cases which were found

in three of the subclinical cases. Two of these showed specific agglutinins at the time of the skin test.

The data set forth in Table 4 show conclusively that it is possible to demonstrate active infection long after exposure to infective material in individuals who never develop clinical manifestations of brucellosis. In other words, active infection in the case of brucellosis does not necessarily imply clinical infection.

The period of incubation in each clinical case that arose during the epidemic is difficult to determine since the exact date or dates of exposure can only be surmised. The onset of the first case was on December 10, 1938; the last on February 10, 1939. If the exposure occurred during the first week of December, the incubation periods would vary from a few days to approximately 2 months.

SUMMARY

During the brucellosis epidemic which occurred at the Michigan State College in the winter of 1938–1939, 45 individuals developed the clinical form, and possibly 49 the subclinical form of the disease. Of the 45 clinical cases, 41 were students, 1 a stenographer, 1 a plumber, 1 a stockroom attendant and 1 a salesman.

Brucella melitensis was cultured from the blood of 36 of the clinical and 3 of the subclinical cases. No other species of *Brucella* was involved.

All possible sources of the infective material responsible for the epidemic are mentioned and discussed.

It has been pointed out that if the infecting organisms came through the water supply of the building due to back-siphonage, certain conditions affecting the water supply would have to exist almost simultaneously. There was no proof obtained that any of the conditions necessary for back-siphonage had occurred in the building during the fall and winter of 1938.

The most convincing evidence in support of the hypothesis of mass infection is the occurrence of the majority of both the clinical and subclinical cases in three laboratory classes.

The hypotheses that have been offered to explain the source of infective material, when subjected to a critical analysis, lack sufficient proof to explain how the epidemic originated.

The results of the different laboratory diagnostic tests show that no one test is always sufficient to confirm the diagnosis of clinical brucellosis shortly after onset. The combined results of all the laboratory tests show that active infection and clinical infection are not synonymous. One may be infected with *Brucella*, and yet never show clinical symptoms of the disease.

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PUBLIC HEALTH AND THE WAR IN ENGLAND

THE evacuation of cities in England at the beginning of the war in the fall of 1939 was " the greatest evacuation in history." Figures now available are of considerable interest to us in this country. Of the 3,644,000 evacuable persons, only one-third consented to the movement, but in 4 days 1,270,000 people were moved from London and other cities to reception areas. Of these, 166,200 were mothers or adults, accompanied by 260,300 young children; 12,291 were expectant mothers; and 734,883 school children who were unaccompanied by mothers. There were also some 5,000 blind and crippled, teachers, and other helpers. The tremendous and sudden increase in the school population in the reception areas is evident. The success of the movement from the public health standpoint was remarkable to an unexpected extent. The evacuation took place at the beginning of September, which is a healthful period, especially as concerns droplet infection, as occurs in measles, whooping cough, and influenza. The incidence of poliomyelitis was one-third, and diphtheria and scarlet fever two-thirds of that for 1938. These good results must be attributed in part to the housing in billets and the absence of concentration camps, though the success of the huge movement without injury to the public health " was built to an enormous extent on the achievements for which medical officers of health have been responsible in years past." [1]

Equally satisfactory is a report on the health of the administrative county of London,[2] which is the only section of England in which the Registrar-General's weekly return gives mortality statistics in sufficient detail by cause and age.

There was a very substantial saving of life under 5 years of age, due largely to a remarkable fall in deaths from pneumonia, bronchitis, diarrhea, and whooping cough. Also the expected epidemic of measles which has occurred regularly every two years failed to appear. This break in the 2-year periodicity of measles is not believed to have been the result of chance, and occurred also in the large cities of Manchester and Liverpool. As the density of the child population in London was not much below normal at the end of 1939, it is probable that the closing of schools was responsible for the nonappearance of the usual outbreak.

This great benefit attributed to the closing of schools and the consequent dispersal of children did not favor those of school age to the same extent as those of the younger age as far as mortality is concerned, though deaths from diphtheria, measles, and whooping cough declined greatly.

In young adults there was a pronounced increase in mortality during the winter due to tuberculosis, bronchitis, respiratory diseases, and heart disease. The deaths from pneumonia did not increase although the winter was severe. For adults over 45 years of age there was a substantial increase in mortality during the severe winter months of January and February, largely due to respiratory and heart diseases, though the increase for pneumonia was less proportionately than for influenza and other respiratory diseases. A marked increase in deaths at ages 45–64 during 3 weeks in January and February is attributed to the prevalence of influenza, and cannot be charged to war conditions.

There has been a large increase in traffic deaths in the larger towns attributable to the blacking out process. Such fatalities were much greater when the moon did not shine than when it was full. All of these figures have been worked out in great detail by the medical statistical officer by methods which will be of interest to statisticians but which here need not be gone into further.

There are many interesting features in the reports which have come to us. While it was recognized that the closing of the schools of cities reduces the chances of the spread of infectious diseases, the epidemiologists feared that the carrying of city children into the rural areas would counterbalance this good effect, but their fears were not realized. The normal public health services of the urban hospitals were necessarily reduced. There was little infectious illness in the reception areas. The whole evacuation was a great success reflecting credit on those responsible for making and executing the plans.

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"HEALTH EDUCATION AND PUBLICITY" A CONTINUATION AND AN EXTENSION

EVERY reader of the *Journal* recalls with gratitude the wealth of material gathered for him from the four corners of the continent by Evart G. Routzahn and presented to him month by month under the modest title "Health Education and Publicity."

This rich flow of usable information about movies, printed matter, books, radio scripts, and about every ingenious idea the mind of man could devise to educate the public in health matters, ceased with Mr. Routzahn's death last year. The department he had edited for years was discontinued because there was no comparable reservoir to be tapped to keep the stream at the same level.

The members of the Health Education Section, who could apply the ideas uncovered by Mr. Routzahn directly to their work, have felt increasingly the lack of a department of this character in the *Journal*. Early in the year, the Section Council set about determinedly to find a successor to Mr. Routzahn if

that could be done, or to propose another method of meeting the acknowledged need. As a result of their effort, a recommendation that the department be reëstablished was brought to the Editorial Board. The recommendation carried with it a request for the appointment of Dr. Donald B. Armstrong as Editor.

The name of Dr. Armstrong was one for the Editorial Board to conjure with. His capabilities for enlarging the scope of the department to include many things beyond the confines of health education were obvious. Just as Mr. Routzahn had given short and lively accounts of what health education workers were doing in terms of their accomplishments, so Dr. Armstrong was equipped to act, but with all public health as his province. Under the stimulation provided by the Council of the Health Education Section, therefore, the Board broadened the base of its recommendation, and voted to invite Dr. Armstrong to edit a new department under a new name, " with a strong health education flavor," but one which would draw from all ten sections for its content.

The Editorial Board takes pleasure in acknowledging its obligation to the Council of the Health Education Section for initiating a proposal which now results in an announcement it is happy to make—that the first issue of " Credit Lines," under the editorial direction of Dr. Donald B. Armstrong, assisted by his colleague John Lentz, will appear in the September *Journal*.

" Credit Lines " is experimental, the Editor insists, and the Board agrees. Readers are invited to make suggestions and comments.

TYPHOID FEVER IN THE UNITED STATES

IN a recent editorial we called attention to the 17th Annual Report on Diphtheria Mortality in Large Cities of the United States,[1] which was most encouraging. Following close on that comes the 28th Annual Report on Typhoid Fever.[2] It has been repeatedly said that typhoid fever is a vanishing disease, and the figures bear out the statement to a great extent. For 1939, 34 cities with an aggregate population of some 6 million went without a single typhoid death during the year. As the figures for the 1940 census are not available, local estimates by the health officers concerned have been used in calculating the rates. The total population of the 34 cities as taken from the American Medical Directory is approximately 5,694,000. While acknowledging a certain amount of inaccuracy, the report is most encouraging. It is especially interesting to note that among the 34 cities having no deaths from typhoid in 1939, 18 are included in the list which had no deaths from diphtheria during that year, which apparently indicates that the energies of the health department were widely distributed and not confined to campaigns against any single disease.

Further evidence is given in a table showing the total typhoid death rate for 78 cities, 1910–1939 inclusive. For the first of these years, 1910, there were 4,637 deaths, a rate per 100,000 of 20.54. By 1914 the deaths had fallen to 2,781, a rate of 11.8. From that time on there has been an almost steady decrease, only one year, 1925, showing a marked increase in deaths as well as rate. During the whole period there were only 5 years in which the steady descent in the rate was broken and in only one was the increase marked. The estimated population in 1910 was 22,573,435 with a death rate of 20.54, while in 1939 the population was 37,112,665 and the death rate had fallen to 0.65.

It must be remembered that these figures are based on reports from the larger cities of the United States. For certain ones the conditions are even better than the report shows, due to the fact that they serve as hospital centers for more or less wide areas, and through their method of keeping statistics the deaths are charged against them. For example, at least 12 cities claim that all their deaths from typhoid fever were in nonresidents, while 8 more state that one-third of the deaths reported were in nonresidents. In 1936 there were but 18 cities in the United States in which there were no deaths from typhoid fever; in 1937, 27; and in 1938, 29.

A special roll of honor includes 14 cities in which no death from typhoid fever has occurred in either 1938 or 1939, among which Bridgeport, Conn., has had no death in 6 years, Fort Wayne none in 5 years, South Bend, Ind., and Utica, N. Y., no death in 4 years, and Fall River, Lynn, Milwaukee, New Bedford, and Wichita have had no deaths for 3 years.

Further, no outbreak severe enough to be called an epidemic has been recorded in any of the 78 cities. Altogether, the report is most encouraging and confirms the observation that typhoid fever is a vanishing disease.

These gratifying results are due directly to control of water sheds, filtration plants, and chlorination. Scientific disposal of sewage and garbage has played its part. For ordinary control of the disease antityphoid vaccination is not recommended, but in times of flood disaster such as those in the Mississippi and Ohio Valleys, it has been most valuable and it is still recommended for vacationists who are going into unknown regions or into those in which the water supply is known not to be well protected.

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THE MESSAGE OF PWA

AS THE work of the Public Works Administration approaches completion, it is fitting that we review and appraise its nation-wide influences upon public health and comfort. Begun in the national crisis of providing work for the unemployed, it has had its effect in all but 3 of the 3,071 counties in the United States, with 16,648 useful and substantial contributions to the better life of the American citizen. From its inception in July, 1933, PWA energized the construction of approximately 70 per cent of all educational structures built in the country during the same period; 65 per cent of all sewage treatment plants; 65 per cent of public buildings; 50 per cent of water works; and 35 per cent of hospitals and allied public health facilities.

Through PWA, many states have progressed further in construction for safe disposal of sewage and other wastes and control of stream pollution in the 6 years since 1933 than in the previous 25 years. Over 1,700 sewerage projects costing approximately $480,000,000 were built, including 871 sewage treatment plants.

PWA pioneered to establish good public housing for the underprivileged and developed 51 large-scale projects before the United States Housing Authority was established to take over this work.

For water supply, PWA has done more than simply aid 2,607 systems at a cost of $321,000,000, including the installation of 888 new water works serving

1,600,000 persons. It has assured the construction only of systems providing water sufficient in quantity and suitable in quality to serve the community needs. It has stressed incorporation of treatment facilities where the water was high in iron, hardness salts, turbidity, color and corrosive qualities, so that more than 500 new treatment plants were installed. It has warned against the dangers to children's teeth of waters high in fluorine so that adequate precautions were taken by local authorities to provide suitable supplies for new systems. It has brought safe public water supplies to hundreds of communities of less than 1,000 population which could not afford them previous to PWA.

At a time when municipal credit was almost extinct, PWA developed acceptable standards for revenue bond obligations, clarified their validity and enforceability through legislation and correct interpretation, gave them more respectable standing in financial markets, purchased revenue bonds from incorporated communities, and thereby successfully financed the construction of hundreds of new water works, sewerage systems, electric and gas improvements, and various other public enterprises for communities with as few as 400 people.

With the public aroused by the school disaster in Texas and the earthquake experience in Los Angeles in 1935, PWA allotments replaced unsafe and obsolete small buildings with modern consolidated schools; provided new structures with improved heating, ventilation, lighting, sanitation, and recreational facilities in place of 1,582 overcrowded and outdated buildings; added 60,000 classrooms with seats for 2,500,000 pupils to our educational facilities to meet the needs of shifting populations and growing enrollments; helped set new high standards of fireproof and safety construction in school buildings; and in all aided 7,283 school and other educational building projects at a cost of $1,176,000,000.

Bearing in mind the findings of the National Health Conference that 60 per cent of the states had fewer hospitals than could be considered adequate and that the normal increase in hospital beds should be 25,000 a year, it is timely to note that PWA funds have provided 121,760 beds in approximately 600 new hospitals costing $368,000,000.

BOOKS AND REPORTS

Good Health and Bad Medicine—*By Harold Aaron, M.D. New York: McBride,* 1940. 328 pp. Price, $3.00.

This book deals with the common everyday medical situations in which the temptation to self-medication is strongest. Its topics include a motley list, but it does cover the everyday health problems of the everyday man and woman. The advice given is simple, practical, and in accord with accepted medical opinion. The fallacies in self-medication for headaches, constipation, indigestion, and similar common ailments, which may be minor in themselves or may signal the onset of more serious disease, is well illustrated. The book is a combination of health advice and debunking of commonly used and highly advertised nostrums, antiseptics, dentifrices, cosmetics, and similar products, many of which are sold to the public wholly or entirely on the basis of artificially stimulated wants, rather than genuine needs. Useful products are listed; also acceptable products which are unobjectionable in themselves, but on behalf of which certain claims should be disregarded. The statement that quinine need not be declared upon the label of proprietary medications under the new Food and Drug Act is an error. The Council on Pharmacy and Chemistry of the American Medical Association accepts mercurochrome as a bacteriostatic, whereas this book lists it categorically as non-acceptable and characterizes it as worthless, which is an extreme view.

The information about drugs, preparations, and appliances is naturally derived principally from reports of Consumers Union, since the author is medical consultant to this organization. Other sources, however, have been drawn upon, such as the U. S. Food and Drug Administration, the Fraud Order Division of the Post Office Department, and the Councils on Pharmacy and Chemistry, Foods and Physical Therapy of the American Medical Association, and the Council on Dental Therapeutics of the American Dental Association, as well as Agricultural Experiment Stations of several states.

The author gives due recognition to the importance and necessity of consulting a physician for any abnormal manifestations, other than the passing indispositions which are part of every individual's life. In the matter of self-medication he advises very few simple and entirely safe procedures, and cautions against the prolonged use of these, since apparently minor disease may progress or be the initial warning of serious conditions in which medical attention is not only essential, but must be invoked early to be effective. The book should be useful in the home, the school and the office of the health educator. W. W. BAUER

Manual for the Conduct of Classes for Expectant Parents—*By Ellen D. Nicely and Her Assistants. Cleveland: Cleveland Child Health Assn.,* 1939, 72 pp. Price, $1.00.

What is a city of approximately 900,000 population doing to reduce its maternal death rate? What has it accomplished in behalf of maternal welfare and how was it done? If you ask Cleveland, Ohio, these questions and many others are answered in a *Manual for the Conduct of Classes for Ex-*

pectant Parents, published by the Cleveland Child Health Association. Very fully and in detail this *Manual* tells the story of what has been and is being done in Cleveland to provide adequate maternity care.

The *Manual* consists of three parts. The first outlines a series of 9 lessons for expectant mothers and describes the content of instruction in sewing which is considered an important adjunct to the classes. Part two gives the content of 4 classes for expectant fathers, and part three outlines what is involved in a complete community program for maternal welfare. The *Manual* also provides excellent illustrations of all record and report forms used in the conduct of the classes.

Not the least part of the book is the Appendix which consists of 12 pages of statistical tables. Class attendance for the year 1938 is analyzed. Deliveries among class members, for the same year, are analyzed according to many classifications. Maternal and infant deaths are broken down by causes. The tables indicate that approximately one-fourth of all the expectant mothers in Cleveland in 1938 attended a class. It would have been interesting to have had in the *Manual* tables showing what happened to those expectant mothers who did not have the benefit of class instruction.*

A careful editing and proofreading would have added greatly to the accuracy and clarity of the *Manual.*

MARGARET REID

* An evaluation not appearing in the *Manual* has been made of the Prenatal Group Instruction Program in Cleveland, Ohio. The significance of the findings of this study should demand the thoughtful attention of all those interested in a reduction of maternal and infant mortality rates, especially neonatal death rates. A copy of the *Evaluation of the Prenatal Group Instruction Program in Cleveland* may be secured from the Cleveland Child Health Association, 1001 Huron Road, Cleveland, Ohio.

Non-Profit Hospital Service Plans *—By C. Rufus Rorem, Ph.D., C.P.A., Director, Commission on Hospital Service, American Hospital Association, Chicago. Published by American Hospital Association, Chicago,* January, 1940. 130 pp. (12 chapters, 5 appendices). Price, $.50.

No one has contributed more factual knowledge to group-plan hospitalization than the author of this booklet. Those interested in hospital management and the economics of medical care are familiar with other publications of Dr. Rorem dealing with the economics of the American hospital structure, method of its support, and the financial problems confronting the hospitals in the United States.

Non-Profit Hospital Service Plans tells the story of group hospitalization since its formative period and presents an excellent picture of the rapid growth of the movement in seven years, from an estimated enrollment of approximately two thousand in 1933 to four and one-half million subscribers in 1940.

The justifiable interest of the American Hospital Association in this movement and the part it has played in the development of group service plans is described, and the various types of plans in existence interpreted.

While it is pointed out in the preface of this brochure that it is not intended to serve as a manual, the reviewer is content that it can very well serve as a guide in the formation, development, and maintenance of prepaid hospitalization plans.

Chapters are devoted to organization, legal aspects, community sponsorship, types of contracts, rates, methods of enrollment, education of the public, etc. A model Enabling Act, and definitions of various common statistical terms are included in well prepared appendices.

This booklet will be of value to those interested in the whole subject of hospital service plans. This may well appeal not only to hospital executives

and trustees, but members of social agencies and others, community minded and interested particularly in the economic aspects of hospital and medical care. CHARLES F. WILINSKY

Convalescent Care: Proceedings of the Conference Held Under the Auspices of the Committee on Public Health Relations of The New York Academy of Medicine, November 9–10, 1939—*New York: New York Academy of Medicine* (2 *East* 103 *St.*), 1940. 261 pp. Book being distributed free to the profession within limits of 1,500.

This book records the proceedings of the conference on convalescent care held under the auspices of the Committee on Public Health Relations of the New York Academy of Medicine on November 9 and 10, 1939. Men and women of national eminence in the fields of medical and surgical care, psychiatry, social work, and hospital management presented papers and discussed all of the factors which are involved in the problem of adequate convalescent care. As aptly pointed out by one of the speakers, convalescent care in its present status may be regarded as, " the unfinished business of medicine." The importance of its being a " continuing service " following medical, surgical, and other forms of patient care was further stressed. It was particularly emphasized that even communities which may be found to offer adequate facilities for the care of the acutely ill are invariably found lacking in the necessary facilities for convalescent and chronic care.

The importance of integrated effort on the part of the medical profession, social worker, and the nurse, as well as the varied aspects of convalescent care to meet the requirements of different types of patients and those suffering from many types of illness was authoratatively emphasized.

The social and administrative aspects of convalescent care, the advantages and disadvantages of institutional versus domiciliary convalescence, the question of the location of the convalescent unit in relation to the proximity of the general hospital received adequate emphasis.

Thirty pages are devoted to an excellent summary of the various phases discussed, and a long range program is outlined for necessary financing to meet the needs of increased facilities for convalescent care.

This book is recommended to all who have an interest in this very essential phase of complete and satisfactory medical care.

CHARLES F. WILINSKY

Public Health Dentistry and Health Security. A text-workbook for students and practitioners—*By Alfred J. Asgis, D.D.S., Ph.D. New York: Clinical Press,* 1939. 122 pp. Price, $3.50.

This outline was prepared to give the student of public health dentistry a general conception of the aims and activities of dentistry in public health and to meet the immediate needs of classroom instruction in social and educational dentistry. Essential materials are presented as used in the author's course in public health dentistry sponsored by the Division of General Education of New York University during the academic year 1938–1939.

The book is divided into 6 learning-teaching units which follow introductory chapters dealing with a review of the field and with a discussion of the scope of dental health education. Reference material is included at the end of each chapter or unit. Sample tests and programs are given in a final section.

An introductory chapter discusses the scope, programs, personnel, coöperating agencies, and criteria for the evaluation

of public health programs. The general aim of a dental health program is "to educate the public through the school children, particularly in the care of the teeth and the prevention of decay." The specific aims of some programs should be to care for as many indigent children as possible in the filling, extraction, and cleaning of teeth. The need is indicated for establishing dental public health on a firm basis in every state or city health department. Such a division of public health dentistry should be under the supervision of a professionally educated and trained dental health director. Before a new program is instituted a community health survey is needed. This practical outline should prove useful to both teachers and students of public health dentistry.

IRA V. HISCOCK

Fetal and Neonatal Death—*By Edith L. Potter, M.D., and Fred L. Adair, M.D. Chicago: University of Chicago Press,* 1940. 207 pp. Price, $1.50.

It is seldom that one finds so much scientific data of current interest packed into so small a compass as in this convenient little volume. The authors have made a "Survey of the Incidence, Etiology, and Anatomic Manifestations of the Conditions Producing Death of the Fetus in Utero and the Infant in the Early Days of Life." The opening chapter brings together a considerable amount of material arranged in convenient form for reference. Before entering upon a discussion of the abnormal the authors describe concisely the normal fetus and infant, bringing together the results of modern research.

A chapter is devoted to the technic of fetal and neonatal post-mortem examinations before taking up the causes of death. The importance of a systematic examination of every dead fetus is stressed. The chapter on special pathology should prove of especial interest to the obstetrician. In this study as in former ones along the same line a considerable number of fetal deaths cannot be accounted for by the pathological findings. This is not a book for popular consumption, but for thoughtful students of a period in life where the mortality is highest.

RICHARD A. BOLT

1. Introduction to Housing: Facts and Principles—*By Edith Elmer Wood, U. S. Housing Authority. Washington: Superintendent of Documents,* 1940. 140 pp., plus Appendices, ill. Price, $.30.

2. Can America Build Houses?—*By Miles L. Colean. Pamphlet No. 19 (revised). New York: Public Affairs Committee, 30 Rockefeller Plaza,* 1940. 31 pp., charts. Price, $.10.

3. The Homes the Public Builds—*By Edith Elmer Wood and Elizabeth Ogg. Pamphlet No. 41. New York: Public Affairs Committee, 30 Rockefeller Plaza,* 1940. 32 pp., charts. Price, $.10.

4. New Homes for Old: Public Housing in Europe and America—*By William V. Reed and Elizabeth Ogg. Headline Book No. 22. New York: Foreign Policy Association, 8 West 40th St.,* 1940. 112 pp., ill.; charts, plans. Price, $.25.

5. Homes: Front Line of Defense for American Life. Special Housing Edition, *Survey Graphic. New York: Survey Associates, 112 E. 19th St., February,* 1940. Ill., Bibliog. Price, $.40.

6. Housing the Masses—*By Carol Aronovici. New York: Wiley, 1939.* 291 pp.; ill., tables. Price, $3.50.

7. Housing for the Machine Age

—By Clarence Arthur Perry. New York: Russell Sage Foundation, 1939. 261 pp. Price, $2.50.

1. This is probably the most valuable single reference work in the housing literature of the past five years. The wealth of data from recent surveys of housing and allied fields which are skillfully presented in charts, graphs, and tables, are extremely useful in themselves, but when they serve as the spring-board for Mrs. Wood's salty and penetrating discussion of housing theory, they take on unique vitality. Always a champion of decent housing as a cornerstone of public health, the author has here treated both the negative and the positive aspects of housing as a health factor.

A thread tying the work together is the statement and demolition of popular fallacies with respect to housing. With clarity and wit, some fifteen such fallacies ("Slums are made by the people who live in them"; "If our great-grandparents went without bathtubs, it is no hardship for working people to do so today"; etc.) are simply set forth and deftly disposed of. The beliefs thus exploded are not only those of housing obstructionists, but also those of housing zealots and emotionalists.

Giving short shrift to those who contend that good housing alone would wipe out disease and juvenile delinquency, the author firmly establishes the rôle of adequate shelter and decent neighborhoods as a basic element, though not the only one, in physical and mental health of human beings, and in the fiscal stability of towns and cities.

If there can be any such thing as a one-volume library on housing, Mrs. Wood has given it to us in these 140 pages.

2. Mr. Colean's pamphlet for the Public Affairs Committee sets forth the programs of the various federal housing agencies against a background of the governmental policies and economic conditions which brought these agencies into being. It stresses also the need for local initiative in a housing program to meet our serious national housing shortage. First issued in 1938, this pamphlet has been revised to cover recent legislative changes in the public housing program.

3. The Wood-Ogg booklet in the Public Affairs series is done with the same skill which characterizes the *Introduction to Housing* reviewed above, though its organization is quite different; a hypothetical housing official addresses an audience of tenants in a public housing project, and in a most readable discussion he answers questions put to him on the scope and purposes of public housing agencies. Briefly but clearly treated are such topics as the housing prospects of families with incomes too high to qualify for federally-subsidized projects, the influence of public housing on private real estate developments, and the value of the often maligned Greenbelt towns developed by Resettlement Administration.

4. In *New Homes for Old* it is recognized that housing progress in Europe is now blacked out; but the experience gained in foreign housing programs is succinctly set forth for the lessons it may teach America. While competent criticism is made of shortcomings in foreign programs, positive emphasis is put on several aspects of long-range foreign housing policy which have hardly emerged as yet in American practice or thinking—such as the recognition of overcrowding as a condition warranting special measures for abatement, the rôle of coöperative housing enterprises, and the need for municipal purchase of housing sites in advance of their development. This work is abundantly illustrated with photographs

and plans of foreign housing developments, and its text is an excellent introduction to both the failures and accomplishments of large-scale housing everywhere.

5. This edition of *Survey Graphic* is the third in a notable series of special issues on housing and planning, the others being dated May, 1925, and October, 1932. The rôles of housing technology, government, political action, taxes, the law, and social planning are covered by leading authorities. The two page bibliography is particularly good, covering many special phases of housing and related planning problems.

6. *Housing the Masses* is written from a broad perspective of 25 years' familiarity with American housing and planning. It is devoted to the problem of rehousing all groups in the population who need it, and not only those who live in slums. In fact, the author intentionally omits discussion of slum problems as such, on the ground that these are abundantly treated elsewhere in the literature. He contends that legislation—even of the admirable types which have created the USHA and FHA—cannot meet the housing needs in the absence of basic changes in the business methods and technical procedures of the building industry, including its real estate branches. Broad-gauge chapters are devoted to the problems of land development, the rôle of financial machinery, the housing market as determined by earning capacity and population trends, and the need for popular and technical education in the field of housing and broad planning. A comprehensive solution, Aronovici contends, means "not only the revamping of the economy and technic of planning and building, but also a readjustment of housing to the functions of the community, and the reorganization of the pattern of the neighborhood and the community to the needs of housing. Without community planning, city, county, state, and regional, designed to implement modern ways of living and to be adjustable to desirable changes, the housing problem cannot be permanently solved."

7. In *Housing for the Machine Age,* Perry has dealt less broadly with the field than might be inferred from his title. The work is primarily concerned with technics for accomplishing large-scale residence construction under the "neighborhood unit formula" developed some years ago by the author. Although he deals at length with details of land assembly and site planning which are of interest primarily to housing technicians, much valuable discussion is given to those elements in neighborhood organization which must underlie any sound development of large-scale housing.

ALLAN A. TWITCHELL

Principles of Healthful Living—*By Edgar F. Van Buskirk, Ph.D., edited by Wilson G. Smillie, M.D. New York: The Cordon Co.,* 1938. 386 pp. Price, $2.25.

A wealth of material dealing with problems in the realm of personal hygiene and practical human physiology is presented in an interesting manner in this volume designed for both the college student and the intelligent citizen. Attention is drawn to the responsibility of the individual to the health of the group. "The health of the individual and the health of the group are inextricably interrelated; to attempt to separate them would be not only artificial but undesirable."

The twelve chapters are grouped into two main sections, the first dealing with a discussion of the fundamental concepts relating to the general nature of the world and state of scientific advancement in which we live, while the

second and larger group considers the problems in the field of physiology and care of the human body.

In the introduction the author points out that knowledge concerning the basic principles of healthful living is not sufficient—but that in addition the adolescent must be inspired and trained to see the value of doing his part to maintain and improve his own health and the health of others. This present work has the threefold purpose of revealing the extent of the problem, exploring the realm of human physiology, and selecting for discussion that material which has at the same time practical and cultural value. Two attitudes which students have found helpful in getting their bearings in life are stated to be friendliness and receptivity to new ideas, and foresightedness. The effects of the advancement of science upon the social problems are explained, and the conclusion is drawn that whereas science gives us the means of refashioning our environment it must be supplemented with education and the acceptance of socially desirable aims if the ideals of human progress are to be realized. As yet society is far from making the best use of the findings of scientific investigation, the author admits.

The physical factors of the environmental background of personal hygiene, such as climate, light, water, and soil are well described. The rise of preventive medicine is given a prominent place in the analysis of the backgrounds of hygiene. The development of the modern conceptions of disease types and the rôle of medicine are treated, the problems of immunity, sterility, control of disease, and natural and artificial bodily defense mechanisms being given careful consideration. Consideration is given to practical problems of human physiology and care and to mental health.

The book is well printed and effectively illustrated with photographs and charts, and contains a useful bibliography. IRA V. HISCOCK

Congenital Malformations. A Study of Parental Characteristics, with special reference to the reproductive process—*By Douglas P. Murphy, M.D., F.A.C.P. Philadelphia: University of Pennsylvania Press,* 1940. 166 pp. Price, $2.00.

This informative study presents the results of an investigation of 890 defective individuals in 884 families obtained from the death certificates in Philadelphia covering the period from January 1, 1929, to December 31, 1933. An attempt is made to determine the frequency of congenital malformations among brothers and sisters in these families and to correlate these data with hereditary and environmental factors.

Death certificates indicating malformations or defects associated with deaths of live-born and still-born babies were used as source material to select the families which were later contacted by trained personnel to secure the data recorded on the questionnaire, a copy of which is included in this study. Information was obtained from home visiting, hospital records, and from physicians familiar with the cases. The data are set up in convenient tables and graphs.

The distribution of the observed malformed individuals by birth rank, together with their theoretical distribution as computed by the Greenwood-Yule reconstruction method, is set forth in a number of tables. The standard deviation of the difference between mean ranks of the observed normal and observed malformed individuals was calculated by the Penrose formula. The conclusions are drawn largely from percentage distributions of the various factors under consideration. The conclusions would have been more convincing if correlation coefficients with

their probable errors had been presented. In the final summary 32 conclusions are drawn, the last of which states that—

> The observations which have been made during the course of the present investigation lead to the general conclusion that gross, human, congenital malformations arise solely from influences which affect the germ cells prior to fertilization. No evidence is available to indicate that they result from factors which operate for the first time after fertilization has taken place. . . . Perhaps the single most convincing piece of evidence in favor of heredity is the frequent duplication of defects in brothers and sisters. This was observed in the case of the more usual, and the more serious malformations, as well as in the more common types of less serious ones.

A helpful list of references to similar studies is given at the end of this volume. RICHARD A. BOLT

The First General Epidemiological and Morbidity Survey of China —*By H. Sutherland Gear, M.D., B.Sc., (Rand); D.P.H. (Lond.) D.T.M. & H. (Eng.). Chinese Medical Association, Special Report Series No. 11.* 183 pp. Price: In China, N. C. $2.00. Abroad, U. S. $1.00 or 4 shillings. (Date and place of publication not stated.)

This report deals with a study made by Dr. Gear who was then Associate in Preventive Medicine and Medical Statistics in the Henry Lester Institute of Medical Research of Shanghai. It was made possible through the coöperation of the Council on Research of the Chinese Medical Association and 27 hospitals which were selected because of their geographical distribution, importance and representative character.

These hospitals were supplied with forms and requested to record, for each new outpatient and inpatient during 1933 and 1934, the date of admission, their present and past domicile, age, occupation, and malady. A modified classification of causes of illness, suitable to the areas, was supplied with instructions in order to make the records uniform. The work thus represents a survey of the conditions which brought Chinese to practitioners of western-type medicine in representative hospitals of China. The disease conditions enumerated are the diagnoses made of the processes responsible for the chief complaints of the patients. The study covers 208,045 patients admitted to 17 hospitals in 1933 and 268,684 patients admitted to 25 hospitals in 1934. Incomplete returns were made from the remaining hospitals surveyed. The report does not differentiate inpatients and outpatients in the statistical tables, nor does it deal with mortality or case fatality.

Students of the mass phenomena of disease in western countries are apt to take for granted official morbidity and mortality publications. Dr. Gear's study represents pioneer work in this field in China. Little reflection, and little knowledge of conditions in China are needed to appreciate the difficulties of his task. For example, the translation of the Chinese age to its western equivalent represents for each patient a statistical chore.

Detailed tables are given distributing patients, according to malady for each of the 2 years, by age, sex, month of admission, and geographical area. Each numerically important disease is compared in these attributes to the total hospital population. The author also compares these figures to hospital statistics published for other localities and points out their similarities and differences. Because of the difficulty in evaluating the selective factors which bring people to hospital inpatient and outpatient care in different localities, he attempts only the broadest generalizations in these comparisons. He also quotes available references which deal with the prevalence or occurrence of different diseases in China.

In both 1933 and 1934 the 8 numeri-

cally important conditions responsible for admission were the same with slight annual differences in their relative importance. Approximately 60 per cent of all admissions in 1934 were for the following causes: Diseases of the Skin and Cellular Tissue (20.1 per cent); Conditions of Violence (9.4 per cent); Diseases of the Digestive System (8.5 per cent); Venereal Diseases (5.9 per cent); Diseases of the Eye (5.2 per cent); Tuberculosis (4.8 per cent); Trachoma (3.9 per cent); and Diseases of the Genito-Urinary System (3.4 per cent). In these, and in other conditions reported, there were differences in proportions in hospitals in different geographic locations but too much importance cannot be attached to this because of the relatively short period of time involved and the difficulties in assessing factors selective for hospital admission. The age and sex selection of a number of the diseases reported differed somewhat from that seen in western countries, but so did the age distribution of the hospital populations.

The author makes sensible conclusions from his material regarding medical needs in the hospitals in China. It is encouraging that his work is being carried on by the Chinese Government and to be hoped that the present war there has not destroyed all of these efforts.

A. G. GILLIAM

World Federation of Education Associations Health Section Report—*Eighth Biennial Conference, August, 1939. New York: World Federation of Education Associations,* 1940. 88 pp. Price, $.60.

The Health Section Report of the World Federation of Education Associations released by the office of the Health Education Secretariat sums its purpose in this paragraph written by the secretary, Sally Lucas Jean:

> While chaos reigns and horrors multiply, children are born, grow and enter school. These boys and girls are either to be strong, healthy adults to carry on the world's work happily, or weaklings who have not had a chance to know, and apply, healthy living customs.

The report is based upon correspondence with regional correspondents representing 40 countries. It shows that in every section of the world reached by the Federation some effort is being made to give the children a chance to learn to avoid disease and to build health. Life situations in most instances are built into the program of health education.

We find correspondents from the countries in which malaria is prevalent reporting the efforts of school children to learn to combat this disease with the means within their power. The effort in other countries is to make hookworm a disease of the past. X-ray examinations of the chest are reported from countries in which tuberculosis is a serious problem. The responsibility assumed by children in relation to their environment was reported as notable in many instances.

The good will cruise of the section which touched the coast of Brazil and Puerto Rico last year showed growing interest in all parts of the world in health education and a desire for aid from those who have experience to give, according to report.

MARY P. CONNOLLY

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH.D.

For Raw Pork Eaters—It seems that it is possible to diagnose acute trichinosis. Malaise, abdominal discomfort, fever, headache and edema about the eyes, plus an eosinophilia and a positive reaction to trichinella antigen are suggested as the signs.

ANDES, J. F., *et al.* Early Mild Infestation with the Parasite Trichinella Spiralis. J.A.M.A. 114, 23:2271 (June 8), 1940.

Current Disease Statistics—In 1939 the reported incidence of influenza was double that of the preceding year and poliomyelitis was more than four times as prevalent. Smallpox was still high but less than in 1938, and diphtheria, measles, meningitis, scarlet fever, and typhoid fever were definitely down. Death rates were lower, too.

ANON. Trend of Morbidity and Mortality During 1939 and Recent Preceding Years. Pub. Health Rep. 55, 19:801 (May 10), 1940.

Toxic Limits of Gases—Pending the completion of the code on toxic limits under preparation by the American Standards Association a table of safe concentrations for hazardous gases or vapors is offered.

BOWDITCH, M., *et al.* Code for Safe Concentration of Certain Common Toxic Substances Used in Industry. J. Indust. Hyg. & Toxicol. 22, 6:251 (June), 1940.

Good Food for Both Child and Teeth—Children with active caries must be considered to have a metabolic disturbance which can be corrected by an optimum intake of the protective foods. This conserves the teeth but also the health of their possessor.

BOYD, J. D. The Rôle of Diet in the Control of Dentinal Caries. J. Am. Dietet. A. 27, 5:750 (May), 1940.

Tuberculosis After-Care — Two papers on the rehabilitation of the tuberculous patient discuss the subject from the Canadian standpoint which differs little from the problem south of the border. Because we have done so little here, and rehabilitation becomes increasingly important as a tuberculosis control measure, these papers contain much of interest.

COLLINS, R. J. After-Care and Rehabilitation of the Tuberculous, (and) HATFIELD, W. H. Rehabilitation. Canad. Pub. Health J. 31, 5:209 (May), 1940.

Duration of Illness Statistics—Tuberculosis, nervous diseases, cerebral hemorrhage, and cancer kept people longest in bed. But many other causes of protracted bed care were unearthed in this nation-wide survey.

COLLINS, S. D. Duration of Illness from Specific Diseases among 9,000 Families, Based on Nation-wide Periodic Canvasses, 1928–1931. Pub. Health Rep. 55, 20:861 (May 17), 1940.

Nursing and Preventive Medicine—Stressing the social aspects of the modern public health program, this paper reviews the history of the development of public hygiene particularly as it impinges on public health nursing.

GALDSTON, I. Effects of Medical Advances on Nursing. Pub. Health Nurs. 32, 6:352 (June), 1940.

British Health Policy—Reasons why the British Medical Association urges the extension of the national health insurance system so that everyone may have the services of a family doctor of his choice.

HILL, C. Whither National Health Insur-

ance? J. Roy. San. Inst. 60, 12:409 (June), 1940.

Where There's a Will—Outlined here are the case finding methods by which pulmonary tuberculosis may be eradicated from the working world.

LONG, C. F. Tuberculosis Case-Finding in Industry. Pub. Health Nurs. 32, 7:441 (July), 1940.

Relative Hospital Facilities—The number of hospital beds and the extent to which they are used depend upon the level of per capita income. Wealthy states have more than twice the institutions that the poorest states can provide, but it is the poor who still have the greatest need of hospital care.

PENELL, E. H., *et al.* Existence and Use of Hospital Facilities among the Several States in Relation to Wealth as Expressed by Per Capita Income. Pub. Health Rep. 55, 19:822 (May 10), 1940.

Superimposed Active and Passive Immunity—In France, nonimmune children exposed to epidemic diphtheria were protected with a dose of toxoid followed in a few minutes with an injection of antidiphtheritic serum; then at fortnightly intervals two more injections of toxoid were given. The same combination of the appropriate antitoxin and anatoxin was used to protect against tetanus.

RAMON, G. Combined (Active-Passive) Prophylaxis and Treatment of Diphtheria or Tetanus. J.A.M.A. 114, 24:2366 (June 15), 1940.

Sound Views about School Health—An emphatic answer to the question as to who shall be responsible for the school health program is given by the U. S. Commissioner of Education. All school health services are, or should be, primarily educative, hence they belong under the jurisdiction of the schools. Medical and dental treatment should not be provided by the schools, for such services are not educative. A local health council is proposed as a measure to insure the adequacy of the non-educative health factors.

STUDEBAKER, J. W. The Administration of Health Education. J. Health & Phys. Ed. 11, 6:339 (June), 1940.

Health Statesmanship—Lack of medical care, defective nutrition, insanitary housing, social insecurity—these are the major health problems today. As we slide down the economic scale, disease and death mount. On the hundredth anniversary of the classic Chadwick report, we need a new one, says this author eloquently.

WINSLOW, C.-E. A. Housing and Health. Pub. Health Nurs. 32, 7:434 (July), 1940.

More about Trichinosis—Hogs fed on uncooked garbage are the chief source of trichinosis. Little can be done to remedy this hazard as long as cities permit the practice to continue. Health officials should take up the cudgels against the hog feeders.

WRIGHT, W. H. Studies on Trichinosis. Pub. Health Rep. 55, 24:1069 (June 14), 1940.

Maternal Death Circumstances—This introduction to a series of puerperal fatality studies reveals that the first hour and the first day are the most dangerous although the average interval between birth of child and death of mother is 9 days. When the baby dies the puerperal fatality rate is 15 times the rate for live births. Many other significant findings are recorded here.

YERUSHALMY, J., *et al.* Studies in Childbirth Mortality. Pub. Health Rep. 55, 23: 1010 (June 7), 1940.

BOOKS RECEIVED

GROWTH AND DEVELOPMENT OF THE YOUNG CHILD. By Winifred Rand, Mary E. Sweeny and E. Lee Vincent. 3d ed. rev. Philadelphia: Saunders, 1940. 462 pp. Price, $2.75.

DIGEST OF LAWS AND REGULATIONS RELATING TO THE PREVENTION AND CONTROL OF SYPHILIS AND GONORRHEA IN THE FORTY-EIGHT STATES AND THE DISTRICT OF COLUMBIA. Compiled under the direction of Bascom Johnson. New York: American Social Hygiene Association, 1940. 438 pp. Price, $5.00.

TEXT-BOOK OF PUBLIC HEALTH. By W. M. Frazer and C. O. Stallybrass. (Formerly Hope and Stallybrass.) 10th ed. Baltimore: Williams and Wilkins, 1940. 504 pp.

BEYOND THE CLINICAL FRONTIERS. By Edward A. Strecker. New York: Norton, 1940. 210 pp. Price, $2.00.

GRADUATE MEDICAL EDUCATION. Report of the Commission on Graduate Medical Education. Chicago: University of Chicago Press, 1940. 304 pp.

A COLLEGE TEXTBOOK OF HYGIENE. By Dean Franklin Smiley and Adrian Gordon Gould. 3d ed. New York: Macmillan, 1940. 539 pp. Price, $2.50.

LIVING. Thurman B. Rice. Chicago: Scott, Foresman, 1940. 464 pp. Price, $2.25.

THE FUNDAMENTALS OF PERSONAL HYGIENE. By Walter W. Krueger. 3d ed. Philadelphia: Saunders, 1940. 304 pp. Price, $1.75.

PUBLIC HEALTH NURSING IN OBSTETRICS. Part I. New York: Maternity Center Association, 1940. 83 pp. Price, $.50.

INSECT PESTS. Wm. Clunie Harvey and Harry Hill. London: Lewis, 1940. 292 pp. Price $2.75.

THE PUBLIC HEALTH NURSE AND HER PATIENT. By Ruth Gilbert. New York: Commonwealth Fund, 1940. 396 pp. Price, $2.25.

DIETETICS. By Alida Frances Pattie. 22nd ed. Mount Vernon: Published by Author, 1940. 868 pp. Price, $3.00.

THE LAW OF PUBLIC HOUSING. By William Ebenstein. Madison: University of Wisconsin Press, 1940. 150 pp. Price, $1.75.

ADMINISTRATIVE COST ANALYSIS FOR NURSING SERVICE AND NURSING EDUCATION. By Blanche Pfefferkorn and Charles A. Rovetta. New York: National League of Nursing Education, 1940. 202 pp. Price, $2.00.

SIMPLIFIED DIABETIC MANUAL. By Abraham Rudy. New York: Barrows, 1940. 216 pp. Price, $2.00.

AMERICAN DOCTORS OF DESTINY. By Frank J. Jirka. Chicago: Normandie House, 1940. 361 pp. Price, Trade edition, $3.75. *Limited edition, $7.50.*

FOR DAUGHTERS AND MOTHERS. By Valeria Hopkins Parker. Indianapolis: Bobbs-Merrill, 1940. 138 pp. Price, $1.50.

PANUM ON MEASLES. (Observations Made During the Epidemic of Measles on the Faroe Islands in the Year 1846 by Peter Ludwig Panum.) A Translation from the Danish. New York: Delta Omega Society, distributed by the American Public Health Association, 1940. 111 pp. Price, $2.50.

AS THE TWIG IS BENT. By Leslie B. Hohman, 1940. New York: Macmillan. 291 pp. Price, $2.50.

THE ERA KEY TO THE USP XI AND NF VI. Revised and Edited by Lyman D. Fonda. 5th ed. Newark: Haynes and George Co., 1940. 320 pp. Price, $1.00.

NATIONAL BATTERY MANUFACTURERS ASSOCIATION. Report of Industrial Hygiene Sessions of the 15th Annual Convention, Oct. 24–25, 1939. Akron, O.: National Battery Manufacturers Association, 1940. 93 pp. Price, *$2.00.*

TWENTY YEARS OF MEDICAL SERVICE TO PALESTINE, 1918–1938. Report Issued by the Hadassah Medical Organization to Commemorate the Opening of the Hadassah-University Medical Center, Jerusalem. Jerusalem: Achvah Co-op. Printing Co., 1939. 151 pp.

TEETH, HEALTH AND APPEARANCE. Developed by Lon W. Morrey. Chicago: Bureau of Public Relations, American Dental Association, 1940. 48 pp.

PRELIMINARY PROGRAM OF THE SCIENTIFIC SESSIONS OF THE 69th ANNUAL MEETING OF THE AMERICAN PUBLIC HEALTH ASSOCIATION, THE 21st ANNUAL MEETING OF THE MICHIGAN PUBLIC HEALTH ASSOCIATION, MEETINGS OF RELATED ORGANIZATIONS, AND OF THE SEVENTH INSTITUTE ON PUBLIC HEALTH EDUCATION

OCTOBER 6–11, 1940

THE Annual Meeting Program Committee offers a preview of the content of scientific sessions planned in connection with the 69th Annual Meeting in Detroit, Mich. Inaccuracies and omissions are to be expected and, it is hoped, they will be excused. The professional affiliations and addresses of speakers are not given, but a complete index to participants will be published in the final program which will be distributed to all delegates at the Registration Desk, Ball Room Floor, Hotel Book-Cadillac. Registration headquarters will be opened at 9:30 A.M. on Sunday, October 6.

THE SEVENTH INSTITUTE ON PUBLIC HEALTH EDUCATION

(Under the Auspices of the Public Health Education Section of the American Public Health Association.)

SUNDAY AND MONDAY, AND TUESDAY A.M.

Sunday

10:00 A.M. General Session—Crystal Ball Room, Hotel Book-Cadillac.

Outline of Institute Program. IRA V. HISCOCK, Sc.D., Director

The Philosophy of Public Health Education. W. W. BAUER, M.D.

The Status of Public Health Education. C. V. AKIN, M.D.

11:15 A.M. Group Discussions with Leaders.

Round Tables: Our 1940 Philosophy as Applied to:

Maternal and Child Health. JESSIE M. BIERMAN, M.D.

Schools and Institutions of Higher Learning. W. CARSON RYAN.

Control of Disease. MILTON ROSE, M.D.

Environmental Factors. BLEECKER MARQUETTE.

Adult Health. H. L. LOMBARD, M.D.

INSTITUTE OF PUBLIC HEALTH EDUCATION (Cont.)

2:00 P.M. General Session—Crystal Ball Room, Hotel Book-Cadillac.

Grandma Is Not Always Wrong. BRUNO GEBHARD, M.D.

2:45 P.M. Group Discussions with Leaders

Round Tables: Technics of the Personal Interview. Leader to be announced.

Technics of Meetings. Leader to be announced.

Printed Matter Clinic. L. B. HERRINGTON, PH.D.

Radio Demonstration, Studio WWJ. HENRY F. VAUGHAN, DR.P.H., and W. J. SCRIPPS.

4:30 P.M. "Get Together"—Relaxation Hour.

Monday

9:30 A.M. General Session—Michigan Room, Hotel Statler.

Organization of Health Education Programs. CLAIR E. TURNER, DR.P.H.

10:15 A.M. Group Discussions with Leaders.

Round Tables:

Exhibit Clinic. MAYHEW DERRYBERRY, PH.D., and DOROTHY B. NYSWANDER, PH.D.

Photography Clinic. ROBERT SCHMUCK.

The Medical Society's Rôle in Lay Health Education. IAGO GALDSTON, M.D.

2:30 P.M. Group Discussions with Leaders.

Round Tables:

Plans of Coördination of Health Education. PHILIP L. RILEY, PH.D.

Public Relations and Health Education. MARY P. CONNOLLY.

Research in Evaluation. MARTHA CRUMPTON HARDY.

New Methods for State Health Departments. BURT R. RICKARDS.

4:30 P.M. Conducted Tour of Exhibits. BRUNO GEBHARD, M.D.

Tuesday

9:30 A.M. General Session—Grand Ball Room, Hotel Statler.

Highlights of the Institute. WILLIAM P. SHEPARD, M.D., H. E. KLEINSCHMIDT, M.D., HUNTINGTON WILLIAMS, M.D., DOROTHY B. NYSWANDER, PH.D., and IRA V. HISCOCK, SC.D.

NOTE: A final program of the Institute may be obtained from the Association office, 50 West 50th Street, New York, N. Y. The registration fee is $3.00 for members of the American Public Health Association, and of the Michigan Public Health Association; and $6.00 for all others. Registration will be closed at the discretion of the Director and early enrollment is accordingly recommended.

OTHER SUNDAY AND MONDAY MEETINGS

AMERICAN SOCIAL HYGIENE ASSOCIATION

Sunday, 8:30 P.M. Crystal Ball Room, Hotel Book-Cadillac.

AMERICAN SCHOOL HEALTH ASSOCIATION

Monday, 8:00 P.M.

First Session—Esquire Room, Hotel Book-Cadillac

Presiding: CHARLES L. OUTLAND, M.D., President

SCHOOL HEALTH PROCEDURES, PRACTICAL AND THEORETICAL

In Tennessee. W. CARTER WILLIAMS, M.D.

In Detroit. JOSEPH G. MOLNER, M.D., and VAUGHN F. BLANCHARD.

Discussion. DON W. GUDAKUNST, M.D.

General Discussion.

Monday, 2:00 P.M.

COMMITTEE ON ADMINISTRATIVE PRACTICE

Grand Ball Room, Hotel Statler

(Health Administrators are invited to attend)

Presiding: E. L. BISHOP, M.D.

Report of the Sub-Committee on State Health Administration. *Chairman,* ROBERT H. RILEY, M.D.

Report of the Sub-Committee on Evaluation of Administrative Practices. *Chairman,* HAVEN EMERSON, M.D.

CONFERENCE OF CLERKS OF FULL-TIME HEALTH DEPARTMENTS

Monday, 9:30 A.M. and 2:30 P.M. Hotel Detroit-Leland.

CONFERENCE OF MUNICIPAL PUBLIC HEALTH ENGINEERS

Monday, 9:30 A.M. and 2:30 P.M. Parlor C, Hotel Statler.

CONFERENCE OF STATE LABORATORY DIRECTORS

Monday, 9:30 A.M. and 2:30 P.M. Ivory Room, Hotel Statler.

CONFERENCE OF STATE SANITARY ENGINEERS

Monday, 9:30 A.M. and 2:30 P.M. Parlor A, Hotel Statler.

INTERNATIONAL SOCIETY OF MEDICAL HEALTH OFFICERS

Monday, 9:30 A.M. and 2:30 P.M. Bagley Room, Hotel Statler.

Monday, 6:30 P.M. Bagley Room, Hotel Statler. Dinner Session.

MICHIGAN PUBLIC HEALTH ASSOCIATION

Monday, 12:30 P.M. Crystal Ball Room, Hotel Book-Cadillac. Luncheon Session.

NATIONAL ORGANIZATION FOR PUBLIC HEALTH NURSING

Monday, 7:00 P.M. Crystal Ball Room, Hotel Book-Cadillac. Dinner Session.

In Honor of Grace Ross, R.N., President of the N.O.P.H.N., for her twenty-five years of service as Director of the Division of Nursing, Department of Health, Detroit, Mich.

(A cordial invitation is extended to everyone to attend.)

A Citizen Looks at Public Health. MARGARET CULKIN BANNING.

STATE DIRECTORS OF HEALTH EDUCATION

Monday, 10:00 A.M. and 2:30 P.M. Parlor F, Hotel Book-Cadillac.

STATE DIRECTORS OF PUBLIC HEALTH NURSING

Monday, 9:30 A.M. and 2:30 P.M. Washington Room, Hotel Book-Cadillac.

Monday, 2:00 P.M.

SYMPOSIUM ON OCCUPATIONAL DISEASES

(Sponsored by the Industrial Hygiene Section)

English Room, Hotel Book-Cadillac

Presiding: KENNETH E. MARKUSON, M.D.

The Health of Storage Battery Workers. W. C. DREESSEN, M.D.
Control of Exposures in the Electroplating Industry. P. B. RASTELLO, M.D.

Putting the Tools of Industrial Hygiene in the Administration of an Occupational Disease Law. S. C. ROTHMANN.

Subject and Speaker to be announced.

SESSIONS FROM TUESDAY, OCTOBER 8 TO FRIDAY, OCTOBER 11

TUESDAY, 9:30 A.M.

LABORATORY

First Session—Banquet Room, Hotel Statler

Section Business.

Report of the Coördinating Committee on Standard Methods. *Chairman,* LIEUTENANT COLONEL A. PARKER HITCHENS, M.D.

Report of the Standard Methods Committee on Diagnostic Procedures and Reagents. *Chairman,* WILLIAM D. STOVALL, M.D.

Report of the Standard Methods Committee on Biology of the Laboratory Animal. *Chairman,* LIEUTENANT COLONEL RAYMOND A. KELSER, PH.D.

Report of the Laboratory Section Representative on the Commission for the Study of Biological Stains. WILLIAM D. STOVALL, M.D.

Sanitary Air Analysis. WILLIAM F. WELLS.

Comparative Efficiency of Media for the Isolation of Shigella Dysenteriae. CATHERINE R. MAYFIELD and MAUD GOBER.

The Value of Bacteriophage Determination as a Supplemental Procedure in the Diagnosis of Bacillary Dysentery. KENNETH M. WHEELER, PH.D., and A. L. BURGDORF, M.D.

Value of Gonorrhea Cultures in the Clinical Management of Gonorrhea. GEORGE SEWELL, M.D., EMILY A. CLARK, M.D., and EMMETT A. NELSON.

The Treatment of Experimental Syphilis with Fever and Neoarsphenamine. RUTH A. BOAK, M.D., CHARLES M. CARPENTER, M.D., and STAFFORD L. WARREN, M.D.

Detection of False Positives in Sero-Diagnosis of Syphilis. REUBEN L. KAHN, D.SC., E. B. MCDERMOTT, and S. MARCUS.

ENGINEERING SECTION, CONFERENCE OF STATE SANITARY ENGINEERS, AND CONFERENCE OF MUNICIPAL PUBLIC HEALTH ENGINEERS

Joint Session—English Room, Hotel Book-Cadillac

Presiding: EARNEST BOYCE, C.E., JOEL I. CONNOLLY, and H. A. KROEZE.

Report of the Committee on Water Supply. *Chairman,* ANSELMO F. [illegible].

Report of the Committee on Waterways Pollution. *Chairman,* CARL E. [illegible].

Report of the Committee on Coördination of Public Health Engineering Activities. *Chairman,* ROY J. MORTON.

Report of the Committee on Municipal Public Health Engineering. [illegible], C.E.

Public Health Aspects of the Manteno State Hospital Typhoid Fever Outbreak. [illegible]

TUESDAY, 9:30 A.M.

EPIDEMIOLOGY

First Session—Bagley Room, Hotel Statler

TENTH ANNIVERSARY SESSION

The History and the Progress of the Epidemiology Section. Commemorating the Tenth Anniversary. JOHN A. FERRELL, M.D.

Chronic Illnesses Among Syphilitic and Tuberculous Families and the Expense to the Community of Such Families. GEORGE H. RAMSEY, M.D., MARJORIE T. BELLOWS, and HILDA FREEMAN SILVERMAN.

Epidemiology of Cancer. JAMES A. CRABTREE, M.D.

Rheumatic Fever—Factors in Its Occurrence. JOHN R. PAUL, M.D.

The Application of Epidemiological Methods to the Study of Distribution of Medical Care. JOHN J. BOURKE, M.D.

INDUSTRIAL HYGIENE

First Session—English Room, Hotel Statler

Address of the Chairman. The Renaissance of Industrial Hygiene. CLARENCE D. SELBY, M.D.

A Preliminary Survey of the Industrial Hygiene Problem in the United States. JOHN J. BLOOMFIELD.

Discussion. HERBERT G. DYKTOR.

Chronic Incapacitation Among Industrial Workers. WILLIAM M. GAFAFER, D.Sc.

Discussion. RICHARD D. MUDD, M.D.

PUBLIC HEALTH NURSING

First Session—Michigan Room, Hotel Statler

Report of the Committee to Study Relationships Between Official and Nonofficial Public Health Nursing Agencies. *Chairman,* JULIA L. GROSCOP, R.N.

Report of the Sub-Committee on Public Health Nursing of the Committee on Administrative Practice. *Chairman,* MARION W. SHEAHAN, R.N.

Brief Reports of Activities of A.P.H.A. Committees on Which the Public Health Nursing Section Has Representation:

Eligibility. AGNES J. MARTIN, R.N.

Nominating. RUTH HOULTON, R.N.

Research and Standards. MARGARET G. ARNSTEIN, R.N.

Administrative Practice. MARION W. SHEAHAN, R.N.

Professional Education. PEARL MCIVER, R.N.

Discussion: Section Activities of the Future.

TUESDAY, 9:30 A.M.

FOOD AND NUTRITION

First Session—Ivory Room, Hotel Statler

NUTRITION RESEARCH

Some Important Factors in the Etiology of Anemias. CYRUS C. STURGIS, M.D.

Clinical Manifestations of Ariboflavinosis. V. P. SYDENSTRICKER, M.D.

The Importance of Dietary Fat. CARL A. HOPPERT, PH.D.

The Chemistry of Growth of Children. ICIE MACY HOOBLER, PH.D.

Rickets in Rural Health. FRED O. TONNEY, M.D.

Report of the Committee on Assay of Foods. *Chairman,* HENRY T. SCOTT, PH.D.

HEALTH OFFICERS

First Session—Crystal Ball Room, Hotel Book-Cadillac

Principles of Administration Applicable to Health Departments. LENT D. UPSON, PH.D.

General Principles of Record Keeping in Health Departments. JOSEPH O. DEAN, M.D., and MARION C. HENDERSON.

Evaluation of Municipal Sanitation Inspection Services. CHARLES V. CRASTER, M.D.

Maternal and Child Health Program Under Title V, Social Security Grants-in-Aid to States. EDWIN F. DAILY, M.D.

Public Health Program Under Title VI, Social Security Grants-in-Aid to States. E. R. COFFEY, M.D.

AMERICAN ASSOCIATION OF STATE REGISTRATION EXECUTIVES

First Session—Hotel Detroit-Leland

TUESDAY, 2:30 P.M.

VITAL STATISTICS

First Session—Founders Room, Hotel Book-Cadillac

Organizing Local Registrars. CAPTAIN STUART T. FRIANT.

WPA Projects in Vital Statistics. JESSAMINE S. WHITNEY.

Centralized Collection of Marriage and Divorce Records and Their Uses. BERNARD M. COHEN, PH.D.

Title to be announced. STUART A. RICE, PH.D.

TUESDAY, 2:30 P.M.

FOOD AND NUTRITION

Second Session—English Room, Hotel Statler

Presiding: FRANK G. BOUDREAU, M.D., and FREDERICK W. FABIAN, PH.D.

SYMPOSIUM ON MEDICAL APPRAISAL OF NUTRITIVE STATUS

An Assessment of the Nutrition of a Rural Population in Tennessee. JOHN B. YOUMANS, M.D.

Mass Studies on Human Nutrition in Pennsylvania. PAULINE BEERY MACK, PH.D.

RESULTS OF EXAMINATIONS ON THE NUTRITIVE CONDITION OF PUPILS IN A HIGH SCHOOL IN NEW YORK CITY, WITH COMMENTS ON METHODOLOGY

The Adaptometer as an Instrument for Detecting Avitaminosis A. CARROLL E. PALMER, M.D.

Growth and Development. Preliminary Report on the Relation of Roentgen Appraisal to Nutrition. WILLIAM SCHMIDT, M.D.

Survey Methods for Selecting Cases of Anemia. DOROTHY G. WIEHL.

Chemical Methods for Determining the Plasma Level of Vitamin C. H. D. KRUSE, M.D.

MATERNAL AND CHILD HEALTH

First Session—English Room, Hotel Book-Cadillac

PRESENT-DAY MEDICAL SERVICES MADE AVAILABLE FOR MATERNAL AND CHILD HEALTH UNDER PUBLIC HEALTH AUTHORITIES

The Place of Maternal and Child Health Services as Part of a Generalized Program in a Health Unit. WILLIAM J. FRENCH, M.D.

Discussion. ROBERT H. RILEY, M.D.

A County Health Unit with Proper Functioning Maternal and Child Health Program. ISADORE DYER, M.D.

Discussion. G. F. MATTHEWS, M.D.

Medical and Dental Services for Dependent Children under Public Health and Welfare Authorities. LAWRENCE C. COLE.

Discussion. RICHARD A. BOLT, M.D.

The Slossfield Health Center—A Typical Example of Local Medical Services for Mothers and Children under Public Health Auspices. WALTER H. MADDOX, M.D.

Discussion and Summary. EDWIN F. DAILY, M.D.

TUESDAY, 2:30 P.M.

PUBLIC HEARING ON THE SCHOOL HEALTH BUDGET OF ANYTOWN

Special Session—Grand Ball Room, Hotel Statler

(Under the auspices of the American School Health Association, the Oral Health Group, and the Program Committee, American Public Health Association.)

Dramatis Personae:

The Mayor of Anytown.....REGINALD M. ATWATER, M.D.

The City Council.....To be announced.

The Health Officer.....To be announced.

The Superintendent of Schools.....N. P. NEILSON, PH.D.

The School Medical Director.....DON W. GUDAKUNST, M.D.

The Director of Nursing.....BOSSE B. RANDLE

The Director of Dental Hygiene.....To be announced.

The Psychiatric Social Worker.....MAUD E. WATSON, PH.D.

The Executive Secretary of the County Medical Society.....RAYMOND H. GREENMAN

A Representative of the Parent-Teachers' Association.....DOROTHY B. NYSWANDER, PH.D.

A Spokesman for the Parochial Schools.....To be announced.

ENGINEERING AND INDUSTRIAL HYGIENE SECTIONS

Joint Session—Banquet Room, Hotel Statler

Presiding: EARNEST BOYCE, C.E., and CLARENCE D. SELBY, M.D.

General Atmospheric Pollution from Gaseous Contaminants. WILLIAM CROCKER, D.SC.

Discussion. HARRY B. MELLER, D.SC.

Composition of Diesel Exhaust Gas. HELMUTH H. SCHRENK, PH.D., and L. B. BELGER.

Discussion. LEONARD GREENBURG, M.D.

A Study of Dust and Other Environmental Conditions in the Tri-State District of Kansas, Oklahoma and Missouri. CHARLES C. DILLS.

Engineering Services in Industry Other Than Control of Occupational Diseases. JOHN J. CONNOLLY.

TUESDAY, 2:30 P.M.

PUBLIC HEALTH EDUCATION

First Session—Bagley Room, Hotel Statler

HEALTH EDUCATION FOR ADULTS

Carrying Health Education to Adults in Rural Areas Through College Students. ELMA ROOD, R.N., GERTRUDE LINGHAM, P.H.N., and SUZAN ARD.

Discussion.

A New Type of Periodical in Health Education. ISRAEL WEINSTEIN, M.D.

The National Story Magazine as a Channel for Legitimate Health Information. VALERIA H. PARKER, M.D.

The Contribution of College Student Health Service to Adult Education. CHARLES E. SHEPARD, M.D.

Florida Public Health Committee Activities. JOHN P. INGLE, SR.

Discussion.

Section Business.

LABORATORY AND EPIDEMIOLOGY SECTIONS

Joint Session—Crystal Ball Room, Hotel Book-Cadillac

Presiding: JAMES P. LEAKE, M.D.

VIRUS DISEASES

Cotton Rats and White Mice as Experimental Animals in the Study of Poliomyelitis. CHARLES ARMSTRONG, M.D.

Epidemiology of Poliomyelitis in Detroit in 1939. FRANKLIN H. TOP, M.D., and HENRY F. VAUGHAN, DR.P.H.

An Institutional Outbreak of Poliomyelitis. A. C. SILVERMAN, M.D.

Observations on Attempted Recoveries of Poliomyelitis Virus During the 1939 Outbreak in Los Angeles. FRED STIMPERT, PH.D., and JOHN F. KESSEL, PH.D.

Fecal Examinations in Poliomyelitis. JAMES D. TRASK, M.D., and JOHN R. PAUL, M.D.

The Silent Intermediate Reservoir Host as Exemplified in Bovine Pseudorabies and Swine Influenza. RICHARD E. SHOPE, M.D.

TUESDAY, 8:30 P.M.

FIRST GENERAL SESSION

Grand Ball Room, Hotel Statler

Presiding: EDWARD S. GODFREY, JR., M.D., *President,* American Public Health Association.

Addresses of Welcome—Introductions by the Chairman of the Local Committee, ABNER LARNED.

THE HONORABLE EDWARD J. JEFFRIES, JR.

H. ALLEN MOYER, M.D.

Presidential Address. Public Health in National Defense. W. S. LEATHERS, M.D., *President-elect,* American Public Health Association.

The Way of Health. Second Annual Delta Omega Lecture. HENRY F. VAUGHAN, DR.P.H.

Announcement of Sedgwick Memorial Medal Award.

Reception to the President and President-elect.

Dancing.

WEDNESDAY, 8:00 A.M.

JOHNS HOPKINS UNIVERSITY ALUMNI

Breakfast Session—English Room, Hotel Statler

HARVARD UNIVERSITY ALUMNI

Breakfast Session—Washington Room, Hotel Book-Cadillac

WEDNESDAY, 9:30 A.M.

VITAL STATISTICS

Second Session—Founders Room, Hotel Book-Cadillac.

Report of the Committee on Accident Statistics. *Chairman,* ROBERT J. VANE.

Report of the Committee on Forms and Methods of Statistical Practice. *Chairman,* A. W. HEDRICH, SC.D.

Report of the Committee on Utilization of Vital Statistics Data During the 1940 Census Period. *Chairman,* W. THURBER FALES, SC.D.

Report of the Committee for the Study of Methods of Estimating Population. *Chairman,* JOSEPH V. DEPORTE, PH.D.

Report of the Committee on Membership. *Chairman,* JESSAMINE S. WHITNEY.

Section Business.

Subject and Speaker to be announced.

What You Can't Do with Mortality Statistics and Why. GEORGE H. VAN BUREN.

Discussion.

WEDNESDAY, 9:30 A.M.

HEALTH OFFICERS AND PUBLIC HEALTH EDUCATION SECTIONS AND AMERICAN SCHOOL HEALTH ASSOCIATION

Joint Session—Crystal Ball Room, Hotel Book-Cadillac

Presiding: ADOLPH WEINZIRL, M.D., CHARLES L. OUTLAND, M.D., and CARL A. WILZBACH, M.D.

ARE WE EMPHASIZING SERVICE IN PUBLIC HEALTH AT THE EXPENSE OF EDUCATION IN HEALTH?

Participants:
WILLIAM P. SHEPARD, M.D., *Panel Chairman*
LEONA BAUMGARTNER, M.D.
W. W. BAUER, M.D.
GEORGE B. DARLING, DR.P.H.
JOSEPH W. MOUNTIN, M.D.
ALBERT B. MCCREARY, M.D.
JOHN T. PHAIR, M.B.
CLAIR E. TURNER, DR.P.H.
DON W. GUDAKUNST, M.D.
DOROTHY B. NYSWANDER, PH.D.

ENGINEERING

First Session—Bagley Room, Hotel Statler

Report of the Joint Committee on Bathing Places of the Engineering Section and the Conference of State Sanitary Engineers. *Chairman,* WARREN J. SCOTT.

A Comparison of Undechlorinated and Dechlorinated 24 and 48 Hour Plate Counts of Swimming Pool Waters. THOMAS M. RIDDICK.

Schistosome Dermatitis as a Bathing Place Problem. JOHN E. MILLER.

Subject and Speaker to be announced.

Section Business.

PUBLIC HEALTH NURSING

Second Session—English Room, Hotel Book-Cadillac

Presiding: MARGARET G. ARNSTEIN, R.N.

INFLUENCING TRENDS IN PUBLIC HEALTH NURSING

An Analysis of the Present Qualifications of Public Health Nurses in the United States. PEARL MCIVER, R.N.

Furnishing Data for Personnel and Other Studies. ALMA C. HAUPT, R.N., and MARIE L. JOHNSON, R.N.

Setting Up New Minimum Qualifications for Public Health Nurses—1940–1945. DOROTHY DEMING, R.N.

Practical Principles of Making and Using Studies. MARIAN G. RANDALL, R.N.

WEDNESDAY, 9:30 A.M.

LABORATORY, FOOD AND NUTRITION, AND EPIDEMIOLOGY SECTIONS

Joint Session—Grand Ball Room, Hotel Statler

Presiding: FREDERICK W. FABIAN, PH.D.

FOOD POISONING

Gastroenteritis Outbreaks from Cream-Filled Pastry. F. E. COUGHLIN, M.D.

Studies of Rebaking Cream-Filled Pastries. F. W. GILCREAS and MARION B. COLEMAN.

Epidemiology of Staphylococci Type of Food Poisoning. R. V. STONE, D.V.M.

The Food Poisoning Micrococci (Staphylococci). W. C. HAYNES and GEORGE J. HUCKER, PH.D.

Typhoid Typing in the Western States. ALFRED S. LAZARUS, PH.D.

The Rôle of Rats in the Spread of Food Poisoning Bacteria of the Salmonella Group. HENRY WELCH, PH.D., M. T. BARTRAM, and MORRIS OSTROLENK.

MATERNAL AND CHILD HEALTH

Second Session—Banquet Room, Hotel Statler

PROGRESS IN PREMATURITY CARE

Essentials in the Care of Premature Infants. JULIUS H. HESS, M.D.

Massachusetts State Program for the Care of Prematures. FLORENCE L. MCKAY, M.D.

A County Program for the Care of Prematures. HENRY R. O'BRIEN, M.D., and MARION I. MURPHY, R.N.

What Constitutes a Suitable Incubator for Premature Infants? ETHEL C. DUNHAM, M.D., H. C. DICKINSON, PH.D., and GRACE J. GOWENS.

Discussion, MAURICE L. BLATT, M.D., HERMAN N. BUNDESEN, M.D., WILLIAM L. FIGHTER, M.D., ELIZABETH M. GARDINER, M.D., J. M. HAYES, M.D., and ROLAND H. LAMB, M.D.

WEDNESDAY, 9:30 A.M.

INDUSTRIAL HYGIENE

Second Session—Michigan Room, Hotel Statler

The Exposure of Workmen to Lead Fume During the Production and Processing of Leaded Steel (Ledloy). A. G. KAMMER, M.D.

Discussion. LOUIS W. SPOLYAR, M.D.

Comparison of Methods for Sampling Lead Fume. LEWIS B. CASE.

Discussion. EDWIN D. MARTIN.

The Response of Animals Attending Exposure to the Vapors of Methyl Bromide. D. D. IRISH, E. M. ADAMS, H. C. SPENCER, and V. K. ROWE.

Discussion. ROBERT A. KEHOE, M.D.

Chronic Manganese Poisoning. PAUL A. NEAL, M.D., ROBERT H. FLINN, M.D., and WILLIAM B. FULTON, M.D.

Discussion.

WEDNESDAY, 12:30 P.M.

INDUSTRIAL HYGIENE

Luncheon Session—Washington Room, Hotel Book-Cadillac

Report of the Committee on Skin Irritants. *Chairman,* LOUIS SCHWARTZ, M.D.

Report of the Committee on Lead Poisoning. *Chairman,* ROBERT A. KEHOE, M.D.

Report of the Committee on Pneumoconiosis. *Chairman,* R. R. SAYERS, M.D.

Report of the Committee on Industrial Anthrax. *Chairman,* HENRY FIELD SMYTH, M.D.

Report of the Committee on Standard Methods for the Examination of Air. *Chairman,* EMERY R. HAYHURST, M.D.

ORAL HEALTH GROUP

Luncheon Session—Ivory Room, Hotel Statler

Where Is Dentistry Going in Public Health? NATHAN SINAI, D.P.H.

ASSOCIATION OF WOMEN IN PUBLIC HEALTH

Luncheon Session—English Room, Hotel Statler

Presiding: SALLY LUCAS JEAN, President.

VOLUNTEER SERVICE IN THE PROMOTION OF HEALTH

Speakers:
FRANK G. BOUDREAU, M.D.
EUNICE FULLER BARNARD.
ELIZABETH M. WAGENET.

WEDNESDAY, 2:30 P.M.

ASSOCIATION OF WOMEN IN PUBLIC HEALTH

Michigan Room, Hotel Statler

Presiding: SALLY LUCAS JEAN, President.

VOLUNTEER SERVICE IN THE PROMOTION OF HEALTH

Speakers:
MRS. GEORGE E. ALTER
MARTHA LESLIE
RUTH O. PIERSON
ROSAMOND LOSH
MRS. ARCH TRAWICK

HEALTH OFFICERS

Second Session—Bagley Room, Hotel Statler

HOW FAR SHOULD HOUSING CONCERN THE HEALTH DEPARTMENT?

(Program Arranged by the Committee on the Hygiene of Housing.)

Chairman of Discussion Panel: C.-E. A. WINSLOW, DR.P.H.

Discussion Panel:
J. M. DALLAVALLE, PH.D.
ALFRED H. FLETCHER
ALLEN W. FREEMAN, M.D.
L. M. GRAVES, M.D.
BLEECKER MARQUETTE
STANLEY H. OSBORN, M.D.
GEORGE C. RUHLAND, M.D.
HENRY F. VAUGHAN, DR.P.H.
H. A. WHITTAKER
HUNTINGTON WILLIAMS, M.D.
ABEL WOLMAN, DR.ENG.
COLEMAN WOODBURY

LABORATORY, ENGINEERING, AND FOOD AND NUTRITION SECTIONS, AND THE MICHIGAN ASSOCIATION OF SANITARIANS

Joint Session—Crystal Ball Room, Hotel Book-Cadillac

Presiding: NELSON HALL, President, Michigan Association of Sanitarians.

RESTAURANT SANITATION

The Enforcement of Dishwashing Regulations Applying to Eating and Drinking Establishments. WALTER VON D. TIEDEMAN, M.C.E.

The Routine Inspection of Restaurant and Beverage Establishments by a Health Department. J. L. POMEROY, M.D., and R. V. STONE, D.V.M.

Cleaning and Sterilizing Drinking and Eating Utensils. W. G. WALTER and GEORGE J. HUCKER, PH.D.

Laboratory Studies of Methods for the Cleansing of Eating, Drinking, and Cooking Utensils. F. W. GILCREAS.

WEDNESDAY, 2:30 P.M.

THE CONTROL OF VENEREAL DISEASES IN A NATIONAL DEFENSE PROGRAM

Special Session—Grand Ball Room, Hotel Statler

Presiding: THOMAS PARRAN, M.D.

Relationship of the Health of Civilians to the Efficiency of the Navy. REAR ADMIRAL ROSS T. MCINTIRE.

The Relationship of the Health of Civilians to the Efficiency of the Army. MAJOR GENERAL JAMES C. MAGEE.

Prostitution as a Source of Infection with the Venereal Diseases in the Armed Forces. Speaker to be announced.

The Control of the Venereal Diseases in Civilian Areas Adjacent to Concentrations of Armed Forces. A. B. PRICE, M.D., and FRANCIS J. WEBER, M.D.

Demonstration in Case Finding Technic. NORMAN R. INGRAHAM, M.D., and HELEN E. WOODS. (*Dramatic Presentation.*)

AMERICAN ASSOCIATION OF STATE REGISTRATION EXECUTIVES

Second Session—Hotel Detroit-Leland

FOOD AND NUTRITION

Third Session—English Room, Hotel Statler

Factors Influencing the Flavor of Milk. PAUL F. SHARP, PH.D.

The Nutritive Value of Milk Fat. EDWARD J. SCHANTZ, PH.D.

Present Status of Researches on Soft Curd Milk. R. L. HILL, PH.D.

Improving the Quality of Milk Supplies in Small Communities. (Report of the Committee on Milk and Dairy Products.) *Chairman,* MERRILL J. MACK. To be presented by C. J. BABCOCK.

PUBLIC HEALTH NURSING SECTION, AMERICAN SCHOOL HEALTH ASSOCIATION, AND ORAL HEALTH GROUP

Joint Session—Banquet Room, Hotel Statler

Presiding: RICHARD C. LEONARD, D.D.S.

MARSHALLING COMMUNITY FORCES FOR DENTAL HEALTH

Speakers:
RHODA P. SHELDON, R.N.
ANNIE J. TAYLOR
JOSEPH I. LINDE, M.D.
FRANK HOUGHTON, D.D.S.

Discussion: FRANK C. CADY, D.D.S., and HAROLD H. MITCHELL, M.D.

WEDNESDAY, 2:30 P.M.

EPIDEMIOLOGY

Second Session—English Room, Hotel Book-Cadillac

TUBERCULOSIS SYMPOSIUM

A Five-Year Follow-up of Discharges from Maryland Tuberculosis Sanatoria. ROSS L. GAULD, M.B., C. H. HALLIDAY, M.D., VICTOR F. CULLEN, M.D., and W. THURBER FALES, Sc.D.

Tuberculosis in Mexican Agricultural Laborers. A. W. NEWITT, M.D., and T. M. KOPPA, M.D.

Use of Miniature X-Ray Films in Tuberculosis Case Finding. BRUCE H. DOUGLAS, M.D., CARL C. BIRKELO, M.D., GAIUS E. HARMON, M.D., and HENRY F. VAUGHAN, DR.P.H.

A Comparison of Secondary Attack Rates in Areas with High and Low Tuberculosis Mortality. W. PALMER DEARING, M.D.

Productive and Non-Productive Examinations in Tuberculosis Case Finding. RALPH HORTON, M.D., N. STANLEY LINCOLN, M.D., JOHN K. DEEGAN, M.D., and MARY E. DALTON.

Tuberculin Sensitivity in School Children and Its Relation to Roentgenological Evidence of Tuberculous Infection. R. S. GASS, M.D.

WEDNESDAY, 6:00 P.M.

PUBLIC HEALTH EDUCATION

STAFF CONFERENCE

Buffet Supper—Esquire Room, Hotel Book-Cadillac

Presiding: CARL A. WILZBACH, M.D.

Acting Health Officer in Charge of Discussion: HUGH R. LEAVELL, M.D.

Staff Conference Representing:

Epidemiology—C. C. DAUER, M.D.
Sanitary Engineering—ALFRED H. FLETCHER
Public Health Nursing—DOROTHY DEMING, R.N.
Public Health Education—SAVEL ZIMAND
Health Education Supervision—LUCY S. MORGAN
Press—JANE STAFFORD, STEPHEN MCDONOUGH, and J. ROSSLYN EARP, DR.P.H.

The members of the group will constitute a staff of experienced men and women, who will draw up a health education plan for a city of 50,000 population, based upon specific needs. This plan will include organization and budget requirements.

Selected members of the audience will constitute a Board of Health and pass upon the recommendations made by the Staff Conference. Other members of the audience will represent the public.

WEDNESDAY, 6:30 P.M.

LABORATORY

Dinner Session—English Room, Hotel Statler

COMMEMORATING FORTY YEARS OF SECTION ACTIVITIES

Report of the Section Archivist. AUGUSTUS B. WADSWORTH, M.D.

ENGINEERING SECTION, CONFERENCE OF STATE SANITARY ENGINEERS, AND CONFERENCE OF MUNICIPAL PUBLIC HEALTH ENGINEERS

Annual Engineers' Stag Dinner—Crystal Ball Room, Hotel Book-Cadillac

THURSDAY, 8:00 A.M.

MASSACHUSETTS INSTITUTE OF TECHNOLOGY

Breakfast Session—Ivory Room, Hotel Statler

MICHIGAN SCHOOL HEALTH ASSOCIATION

Breakfast Session—Washington Room, Hotel Book-Cadillac

THURSDAY, 9:15 A.M.

PROFESSIONAL EDUCATION

Second General Session—Grand Ball Room, Hotel Statler

Presiding: WILLIAM P. SHEPARD, M.D., *Chairman,* Committee on Professional Education.

The Work of the Committee on Professional Education. WILLIAM P. SHEPARD, M.D.

The Education and Training of the Physician for a Public Health Career. EDWARD S. GODFREY, JR., M.D.

The Education and Training of Personnel Other Than Physicians. ABEL WOLMAN, DR.ENG.

THURSDAY, 10:30 A.M.

ENGINEERING

Second Session—English Room, Hotel Book-Cadillac

Some Public Health Engineering Aspects of Epidemiological Investigations of Water and Food-Borne Outbreaks. ARTHUR E. GORMAN.

Cross-Connections and Related Plumbing Problems. L. GLEN SHIELDS.

Typhus Control. ROY J. BOSTON.

A Discussion of Population Shifts Consequent Upon a Subsidized Housing Project. L. M. GRAVES, M.D., and ALFRED H. FLETCHER.

THURSDAY, 10:30 A.M.

MATERNAL AND CHILD HEALTH

Third Session—Crystal Ball Room, Hotel Book-Cadillac

SUPERVISION OF MATERNAL AND CHILD HEALTH CONFERENCES WITH DEVELOPMENT OF MEDICAL CONSULTATION SERVICES

Coöperation between County Health Officials and Medical, Dental, and Nursing Services Available in a Community for Maternal and Child Health. E. V. THIEHOFF, M.D.

Discussion. E. J. BRENNER, M.D.

Organization, Supervision, and Objectives of Prenatal Medical Supervision. Are They Being Met by the Average Prenatal Clinic? E. D. PLASS, M.D.

Discussion. H. J. BICKERSTAFF, M.D.

Objectives of Regular Child Health Supervision. Are They Being Met by the Average Child Health Conference? AMOS CHRISTIE, M.D.

Discussion. JESSIE M. BIERMAN, M.D., and HESTER CURTIS, M.D.

City Program of Maternal and Child Health Tied Up with Visiting Nurse Association Services. ELIZABETH G. FOX, R.N.

Discussion. IRA V. HISCOCK, Sc.D.

Clinical Consultation Services and Hospital Care in a Maternal and Child Health Program. MARTHA L. CLIFFORD, M.D.

Discussion. CHARLES H. PECKHAM, M.D.

HEALTH OFFICERS AND EPIDEMIOLOGY SECTIONS

Joint Session—Grand Ball Room, Hotel Statler

Presiding: ADOLPH WEINZIRL, M.D., and JAMES P. LEAKE, M.D.

The Period of Communicability of Syphilis. JOSEPH EARLE MOORE, M.D.

The Recent Extension of Endemic Typhus Fever in the United States. HENRY E. MELENEY, M.D.

Case Finding and Case Holding in the Detroit Syphilis Control Program. LOREN W. SHAFFER, M.D., OSCAR D. SCHWARTZ, M.D., and PAUL T. SALCHOW, M.D.

Geographical Distribution of Serological Types of Hemolytic Streptococci in Scarlet Fever. JOHN E. GORDON, M.D., JOHN H. JANNEY, JR., M.D., and F. F. SCHWENTKER, M.D.

Secondary Attack Rates in Pneumonia: A Study of 14,000 Household Contacts. EDWARD S. ROGERS, M.D., MORTON ROBINS, M.S.P.H., MARGARET G. ARNSTEIN, R.N., and GEORGE H. RAMSEY, M.D.

THURSDAY, 10:30 A.M.

PUBLIC HEALTH EDUCATION

Second Session—Banquet Room, Hotel Statler

NEW TECHNICS IN VISUAL EDUCATION

Increasing the Value of This Medium Through the Utilization of Given Technics. (Demonstration with high school students and accident prevention motion picture.) ALICE V. KELLIHER, PH.D.

Discussion.

Public Health Application of High Speed Photography. CLAIR E. TURNER, DR.P.H. (*Stereopticon illustration.*)

Discussion.

Report of the Joint Committee on Community Organization for Health Education. *Chairman,* CLAIR E. TURNER, DR.P.H.

Report of the Committee to Study the Work of the Section. *Chairman,* DAVID B. TREAT.

Report of the Committee for the Study of State Administration of Health Education. *Chairman,* BURT R. RICKARDS.

Report of the Committee on School Health Policies. *Chairman,* EDNA A. GERKEN, C.P.H.

Report of the Joint Committee on Coördination of Activities. *Chairman,* CARL A. WILZBACH, M.D.

INDUSTRIAL HYGIENE AND PUBLIC HEALTH NURSING SECTIONS

Joint Session—Bagley Room, Hotel Statler

Presiding: MARION W. SHEAHAN, R.N., and CLARENCE D. SELBY, M.D.

Difficulties in Keeping the Industrial Nurse in Small Plants in Touch with Public Health Nursing. VICTORIA C. STRALKO, R.N.

The Use of Existing Visiting Nurse Associations in Industrial Service for Small Plants. RUTH HUBBARD, R.N.

Opportunities of a Nurse in the Control of Occupational Health Hazards in the Small Plant. T. LYLE HAZLETT, M.D.

Discussion. DONALD M. SHAFER, M.D.

Health Maintenance in a Group of Small Industries. RUSSELL B. ROBSON, M.D.

VITAL STATISTICS

Third Session—Founders Room, Hotel Book-Cadillac

Exhibits. MAYHEW DERRYBERRY, PH.D.

The Effect of War on Vital Statistics. JOHN T. MARSHALL.

Place of Mortality Statistics in Epidemiology. JAMES A. DOULL, M.D.

Occupational Mortality. ROBERT J. VANE.

THURSDAY, 10:30 A.M.

LABORATORY AND FOOD AND NUTRITION SECTIONS

Joint Session—Ivory Room, Hotel Statler

Presiding: FREDERICK W. FABIAN, PH.D., and HAROLD W. LYALL, PH.D.

MILK

Report of the Standard Methods Committee on Examination of Dairy Products. *Chairman,* ROBERT S. BREED, PH.D.

Report of the Standard Methods Committee on Analyzing Frozen Desserts. *Chairman,* FRIEND LEE MICKLE, SC.D.

Phosphatase Production in Dairy Products by Various Microörganisms. B. W. HAMMER, PH.D., and H. C. OLSON, PH.D.

A Modification of the Kay and Graham Phosphatase Test as a Means of Controlling the Adequate Pasteurization of Milk. J. WYLLIE, M.B.

Further Study of the Application of the Field Phosphatase Test to the Control of Pasteurization. F. W. GILCREAS and WALTER S. DAVIS.

A Simplified Procedure for the Laboratory Examination of Raw Milk Supplies. ROBERT P. MYERS, PH.D., and JOHN A. PENCE.

The New Tgem Agar for Milk Analysis. HOWARD E. LIND, C.P.H.

To What Extent Should Bacterial Counts of Milk Be Given Publicity? C. C. PROUTY.

Discussion. MILTON E. PARKER.

LABORATORY

Second Session—English Room, Hotel Statler

Presiding: ELLIOTT S. ROBINSON, M.D.

PNEUMONIA

Report of the Standard Methods Committee on Biological Products. *Chairman,* ELLIOTT S. ROBINSON, M.D.

An Immunological Study of Pneumococcal Toxins. G. BURDE and JOHN T. TRIPP, PH.D.

Present Status of Pneumococcus Classification. WHEELAN D. SUTLIFF, M.D., and ANNABEL W. WALTER.

The Pneumonia of Friedlander's Bacillus. LOUIS A. JULIANELLE, M.D.

The Bacteriological Diagnosis of Pneumonia in Relation to Chemotherapy. COLIN M. MACLEOD, M.D., and GEORGE S. MIRICK, M.D.

Antipneumococcic Serum Production and Standardization. HAROLD W. LYALL, PH.D.

The Present Status of Knowledge Concerning Influenza. FRANK L. HORSFALL, JR., M.D.

Discussion. RALPH S. MUCKENFUSS, M.D.

THURSDAY, 12:30 P.M.

FOOD AND NUTRITION

Luncheon Session—Ivory Room, Hotel Statler

Section Business.

Reports of Committees.

THURSDAY, 12:45 P.M.

DELTA OMEGA

Luncheon Session—Michigan Room, Hotel Statler

THURSDAY, 2:00 P.M.

CONFERENCE OF STATE DIRECTORS OF LOCAL HEALTH SERVICES

Washington Room, Hotel Book-Cadillac

THURSDAY, 2:30 P.M.

AMERICAN ASSOCIATION OF STATE REGISTRATION EXECUTIVES

Third Session—Hotel Detroit-Leland

AMERICAN SCHOOL HEALTH ASSOCIATION AND MICHIGAN SCHOOL HEALTH ASSOCIATION

Joint Session—Crystal Ball Room, Hotel Book-Cadillac

Presiding: CHARLES L. OUTLAND, M.D., President, American School Health Association.

EVALUATION OF SCHOOL HEALTH PRACTICES

Panel Discussion Leader: CHARLES H. KEENE, M.D.

THURSDAY, 7:00 P.M.

THIRD GENERAL SESSION

Annual Banquet—Grand Ball Room, Hotel Statler

Presiding: EDWARD S. GODFREY, JR., M.D., *President,* American Public Health Association.

Master of Ceremonies: ABNER LARNED.

Presentation of Forty Year Membership Certificates.

Announcement of Health Conservation Contest Awards.

Presentation of Diplomas to Graduates of Detroit Department of Health.

Entertainment.

Dancing.

FRIDAY, 8:00 A.M.

UNIVERSITY OF MICHIGAN ALUMNI

Breakfast Session—Michigan Room, Hotel Statler

AMERICAN SCHOOL HEALTH ASSOCIATION

Breakfast Session—Parlor F, Hotel Statler

FRIDAY, 9:30 A.M.

PUBLIC HEALTH EDUCATION SECTION AND AMERICAN SCHOOL HEALTH ASSOCIATION

Joint Session—Bagley Room, Hotel Statler

Presiding: CARL A. WILZBACH, M.D., and CHARLES L. OUTLAND, M.D.

SCHOOL HEALTH PROMOTION

Environment. EDNA A. GERKEN, C.P.H.

Instruction. MABEL E. RUGEN, PH.D.

Services. HELEN A. CARY, M.D., ELLA E. MCNEIL, R.N., and J. M. WISAN, D.D.S.

The Physician as Adviser. ARTHUR R. TURNER, M.D.

Coördination of Health and Education Agencies. WALTER WILKINS, M.D.

Discussion.

MATERNAL AND CHILD HEALTH

Fourth Session—Banquet Room, Hotel Statler

(Members of the American School Health Association are cordially invited.)

PREVENTION AND CARE OF RHEUMATIC HEART DISEASE IN CHILDREN

Basic Principles in the Care of Cardiacs under the Crippled Children's Program of the Social Security Act. BETTY HUSE, M.D.

Development of Cardiac Clinics in Indiana. HOWARD B. MITTEL, M.D.

Care of Chronically Ill Cardiac Children in Institutions and Foster Homes. T. DOGGETT JONES, M.D.

Medical Social Problems of Rheumatic Children. ETHEL COHEN.

[illegible] H[illegible], M.D., and WILLIAM D. STROUD, M.D.

FRIDAY, 9:30 A.M.

LABORATORY

Third Session—Washington Room, Hotel Book-Cadillac

Presiding: JOHN F. NORTON, PH.D.

WATER

Report of the Standard Methods Committee on Examination of Water and Sewage. *Chairman*, W. L. MALLMANN, PH.D.

Report of the Standard Methods Committee for the Examination of Shellfish. *Chairman*, JAMES GIBBARD.

A Study of Standard Methods for the Detection of Coliform Organisms in Raw and Treated Waters. EARLE K. BORMAN, ELIZABETH D. ROBINTON, and CHARLES A. STUART, PH.D.

Studies on the Uses of a Lauryl Sulfate-Tryptose-Lactose Broth for the Detection of Coliform Organisms. W. L. MALLMANN, PH.D., and C. W. DARBY.

Eijkman Relationships in the Various Types of Coliform Organisms. CHARLES A. STUART, PH.D., and MURIEL BAKER.

Random Thoughts on Characteristics of Coliform Bacteria. MAX LEVINE, PH.D.

A Comparative Study of Standard Agars for Determining Bacterial Counts in Water. ROBERT S. BREED, PH.D., and W. L. MALLMANN, PH.D.

Breakpoint Chlorination. A. E. GRIFFIN, PH.B., and N. S. CHAMBERLIN.

LABORATORY AND EPIDEMIOLOGY SECTIONS

Joint Session—Crystal Room, Hotel Book-Cadillac

Presiding: HAROLD W. LYALL, PH.D.

Antirabic Vaccination—Present Status. LESLIE T. WEBSTER, M.D.

Antirabic Vaccination of Dogs. HERBERT W. EMERSON, M.D.

Epidemiological Investigation of Rural Typhoid With the Aid of the VI Agglutination Test. CALISTA P. ELIOT, SC.D., and W. ROSS CAMERON, M.D.

Typhoid Vaccine Studies. Progress Report. DON LONGFELLOW, M.D., and GEORGE F. LUIPPOLE. Presented by Lieutenant Colonel GEORGE C. DUNHAM, M.D.

The Distribution of Vectors of Encephalomyelitis in Massachusetts. ROY F. FEEMSTER, M.D., and V. A. GETTING, M.D.

Epidemic Diarrhea of the New-born—Food Poisoning. JAMES G. CUMMING, M.D.

FRIDAY, 9:30 A.M.

HEALTH OFFICERS

Third Session—Grand Ball Room, Hotel Statler

Presiding: MALCOLM R. BOW, M.D.

Present Status of Pneumonia Control. DALE C. STAHLE, M.D.

Diffusion of Health and Medical Services in a Local Health Department Program. C. L. SECKINGER, M.D.

Public Health Importance of Intravenous Drip Method for Treatment of Syphilis. GEORGE BAEHR, M.D.

Children's Dentistry. K. R. GIBSON, D.D.S.

National Hospital Program. JOSEPH W. MOUNTIN, M.D.

INDUSTRIAL HYGIENE

Third Session—English Room, Hotel Statler

Quantitative Analysis by X-ray Diffraction: The Determination of Quartz. J. W. BALLARD and HELMUTH H. SCHRENK, PH.D.

Ventilation Problems in Industrial Hygiene. P. W. GUMAER.

Rapid Method of Determining Air-borne Toxic Materials. WILLIAM P. YANT.

ENGINEERING

Third Session—Ivory Room, Hotel Statler

Report of the Committee on Sewage Disposal. *Chairman,* LANGDON PEARSE.

The Detroit Sewage Treatment Works. Speaker to be announced.

The Value of 24 Hour Laboratory Control of a Water Treatment Plant. W. M. WALLACE.

The Need for Greater State Supervision of Water Works. ISADOR W. MENDELSOHN, C.E.

Microbiological Transformations in Sanitary Landfills. LEWIS V. CARPENTER,* LLOYD R. SETTER, PH.D., and E. STOFKA.

* Deceased.

VITAL STATISTICS

Fourth Session—Founders Room, Hotel Book-Cadillac

The Analysis of Heart Disease Mortality Statistics. O. F. HEDLEY, M.D.

Hospital Records as a Source of Morbidity Statistics. CLARA E. COUNCELL.

Other subjects and speakers to be announced.

FRIDAY, 9:30 A.M.

FOOD AND NUTRITION AND PUBLIC HEALTH NURSING SECTIONS

Joint Session—English Room, Hotel Book-Cadillac

Presiding: MARION W. SHEAHAN, R.N.

Nutrition Integrated in a Nursing Agency. DOROTHY HACKER, LUELLA LEWIS, R.N., and Staff Nurses.

Principles Involved in Any Integrated Nutrition Service. MARJORIE HESELTINE.

Principles Involved in Integrating Any Consultant Service. HELEN BEAN, R.N.

FRIDAY, 2:30 P.M.

FOOD AND NUTRITION SECTION, AMERICAN SCHOOL HEALTH ASSOCIATION, AND ORAL HEALTH GROUP

Joint Session—English Room, Hotel Book-Cadillac

Presiding: FREDERICK W. FABIAN, PH.D., and CHARLES L. OUTLAND, M.D.

NUTRITION AND ITS RELATION TO DENTAL HEALTH

What Can the Dental Health Workers Teach in Regard to Nutrition? WILLIAM R. DAVIS, D.D.S.

A Preschool Dental Service Program with Coördinated Nutritional Study. RICHARD C. LEONARD, D.D.S.

Nutrition Education in a Dental Program. RUTH L. WHITE.

Nutrition and Dental Health Education at Different Grade Levels in the Elementary Schools. HARRIET STONE.

Creating a Dental Consciousness Within a Community. BERTHA HOLMAN.

Discussion: F. O. PEARSON, M.D.

EPIDEMIOLOGY

Third Session—Washington Room, Hotel Book-Cadillac

Epidemiology and Laboratory Diagnosis of Infectious Jaundice (Weil's Disease). JOSEPH G. MOLNER, M.D., and JOSEPH A. KASPER, M.D.

Advances in the Treatment of Amebiasis. JOHN G. MATEER, M.D.

Accumulation and Storage of Arsenic Following Malarial Control Operations. M. M. ELLIS.

A Method of Measuring the Effectiveness of Preventive Treatment in Reducing Morbidity. C. A. SARGENT, M.D., and MARGARET MERRELL, SC.D.

FRIDAY, 2:30 P.M.

PUBLIC HEALTH NURSING SECTION AND MICHIGAN STATE ORGANIZATION FOR PUBLIC HEALTH NURSING

Joint Session—Founders Room, Hotel Book-Cadillac

COMPLETE COMMUNITY HEALTH SERVICE IN RURAL AREAS

Presiding: MARION W. SHEAHAN, R.N.

The Relationship of the Rural Community Hospital to the Rural Health Department in Meeting Community Sickness Problems. J. Moss BEELER, M.D.

Discussion: W. FRANK WALKER, DR.P.H.

Nursing Care of the Sick as a Part of Complete Nursing Service in Rural Areas. HELENE BUKER, R.N.

Discussion: VELLA YOUNG.

AMERICAN ASSOCIATION OF STATE REGISTRATION EXECUTIVES

Fourth Session—Hotel Detroit-Leland

THE TWENTY-SECOND ANNUAL HEALTH EXHIBIT

TO many delegates to the Annual Meeting, the exhibits assembled for their information are as important and valuable as the scientific program. Believing that a preview of the displays sponsored by commercial organizations would have interest for them, exhibitors have been invited to indicate what delegates may expect to see. The descriptions submitted with booth numbers follow:

ALBA PHARMACEUTICAL COMPANY

NEW YORK, N. Y. No. 44

ZEPHIRAN INDUSTRIAL, exhibited by the Alba Pharmaceutical Company, has demonstrated a remarkable application in the field of eating and drinking utensil sanitization. This sanitization agent is based upon a new chemical principle and does not contain chlorine, cresol, or heavy metals. It is virtually non-toxic and non-poisonous. In addition, it is odorless and practically tasteless in useful concentrations.

A. S. ALOE COMPANY

ST. LOUIS, MO. Nos. 8 AND 10

New and recent Public Health Laboratory equipment and devices will be on display, as well as standard and improved staple apparatus. The new Abe Vansen Colony Counter, an improved model of the St. Louis Low Reading Turbidometer, Aloe Precision Heavy Duty Kahn Shaking Machine, a complete line of Kahn Pipettes, as well as an improved rapid reading Kahn Viewing Lamp will be shown.

THE AMERICAN ASSOCIATION OF MEDICAL MILK COMMISSIONS, INC.

NEW YORK, N. Y. No. 46

The American Association of Medical Milk Commissions and the Wayne County Medical Milk Commission are coöperating in the presentation of an exhibit stressing the value of Certified Milk. The safety, cleanliness, nutritional value, as well as the extra medical and veterinary supervision will be demonstrated. The three farms producing Certified Milk for the Detroit market will be open for inspection during the meeting, and competent guides will be provided for those interested in visiting the farms.

AMERICAN CAN COMPANY

NEW YORK, N. Y. Nos. 7, 9, AND 11

Convention delegates are invited to visit Booths 7, 9, and 11, where information is available concerning those aspects of commercially canned foods which are of particular interest to members of the American Public Health Association. The Ameri-

can Can Company's modern, single-service, paper milk container will also be featured.

AMERICAN INSTRUMENT COMPANY

SILVER SPRING, MD. No. 21

Among the instruments to be exhibited by the American Instrument Company will be the following: incubators, pipetting machines, anaerobic jars, stainless steel test tube racks, test tube washers, neutral wedge photometers, photoelectric photometers, abridged spectrophotometers, serological baths, circulating pumps, pH meters, null indicators, machines for cutting glass, tubing, etc., and centrifuges. A technician will be in attendance to answer questions relative to the company's line of instrumentation for public health and other laboratories.

AMERICAN STERILIZER COMPANY

ERIE, PA. No. 77

THE BORDEN COMPANY

CHICAGO, ILL. No. 45

The exhibit will display in graphic form the economy of milk and its products.

CARNATION COMPANY

OCONOMOWOC, WIS. Nos. 58 and 59

Be sure to visit the Carnation Company exhibit in Booths 58 and 59 where you will see displayed an interesting model of the famous Carnation Milk Farms where cattle breeding and feeding experiments are carried on for the purpose of improving the dairy herds supplying the many Carnation evaporating plants. The story of Carnation's program of supervision of raw milk sources and the careful processing of Irradiated Carnation Milk is also told in a unique manner.

THE COCA-COLA COMPANY

ATLANTA, GA. No. 38

Coca-Cola will be served to the delegates at the 69th Annual Convention in Detroit with the compliments of The Coca-Cola Company.

THE CREAM OF WHEAT CORPORATION

MINNEAPOLIS, MINN. No. 78

The New 5-Minute "CREAM OF WHEAT" will be featured here. This improved cereal is completely cooked in 5 minutes and has been fortified with additional Vitamin B_1 (Wheat Germ), iron, calcium and phosphorus.

R. B. DAVIS COMPANY

HOBOKEN, N. J. No. 85

Cocomalt will be served. Year by year Cocomalt has kept abreast of growing nutritional knowledge. As the necessity of Vitamin D for routine administration was demonstrated, Cocomalt added adequate Vitamin D. When rather widespread deficiency of Vitamin A was shown, this Vitamin was increased in Cocomalt. Now Vitamin B_1 has been added to Cocomalt—*75 units per ounce*. Yet the addition of this important vitamin has not increased the price nor lowered its palatability.

DIFCO LABORATORIES, INC.

DETROIT, MICH. No. 82

Exhibit of the dehydrated culture media prepared in accordance with the formulae of the American Public Health Association's "Standard Methods of Water Analysis" and "Standard Methods for the Examination of Dairy Products," as well as other media useful in "Public Health" bacteriology. Demonstration of the *new* Bacto-S S Agar and *revised* Bacto-MacConkey's Agar in the isolation of Shigella and Salmonella strains, and media for identification of members of the typhoid-paratyphoid-dysentery group.

THE DIVERSEY CORPORATION

CHICAGO, ILL. No. 34

Have you a problem in food sanitation? You will find the answer in Booth No. 34, sponsored by The Diversey Corporation of Chicago. Demonstration of Diversey products widely used for cleaning and sterilizing operations in all types of food plants will be made. The Company's technical experts will be on hand to consult with health officials, plant operators, and other interested parties. Several new Diversey products, developed within the past year, will be on display.

EISELE & COMPANY

NASHVILLE, TENN. No. 72

Eisele & Company, Nashville, Tenn., and New York, N. Y., will, in addition to their regular line of hypodermic syringes, needles, and self-sterilizing thermometers, display their new Rust Free Suture needles. These should be of interest to public health officials because the war has disturbed the usual importations which comprise most of the suture needles used in the United States.

J. H. EMERSON COMPANY

CAMBRIDGE, MASS. Nos. 74 AND 75

In Booths 74 and 75, the J. H. Emerson Company will show the latest models of the Emerson Respirator or "iron lung" and also other medical equipment manufactured by this company including a new model resuscitator and inhalator combination and a recently developed fever therapy cabinet. The respirator will be equipped with many new features which greatly add to the convenience and care of the patient and to his comfort.

EVAPORATED MILK ASSOCIATION

CHICAGO, ILL. No. 61

The Evaporated Milk Association will have on exhibit educational materials suitable for use in public health nutrition programs. These booklets cover the subjects of infant feeding, low cost family feeding, mother and child care, preschool diets, and the preparation of food in quantity. Also available are technical publications and reprints of scientific research on the nutritive value and uses of evaporated milk.

EX-CELL-O CORPORATION

DETROIT, MICH. No. 43

The Ex-Cello-O Corporation's Pure-Pak exhibit will include a display of finished Pure-Pak single-service containers for milk and other dairy products, in quart, pint, and half-pint sizes; a display of the flat, printed cartons from which these containers are formed by Pure-Pak equipment (as well as filled and sealed), and the board from which converting plants manufacture these blanks. There will also be descriptive literature covering the entire Pure-Pak process and the Pure-Pak machines.

THE J. B. FORD SALES COMPANY

WYANDOTTE, MICH. No. 12

The J. B. Ford Sales Company, distributors of Wyandotte Products manufactured by the world's oldest and largest producer of specialized cleaning materials, will feature the following: Wyandotte Steri-Chlor—a non-corrosive chlorine germicide for use wherever food is prepared or served. Samples of this dry powder are available; Wyandotte Dish-washing Products—Five *different materials to fit* different water conditions; Wyandotte Bottle Washing Alkalies—To satisfy bottle washing requirements four Wyandotte Products are produced for this use.

GENERAL ELECTRIC X-RAY CORPORATION

CHICAGO, ILL. Nos. 23 AND 25

The General Electric X-Ray Company will exhibit its unit for photoroentgenography, the new case finding method to detect tuberculosis by

photographing the fluoroscopic image on a 4" by 5" film for direct diagnosis. Tests made at the Herman Kiefer Hospital in Detroit have shown the photoroentgenographic method to be 97.4 per cent as accurate as conventional roentgenography but only one-tenth as costly. Actual photoroentgenograms will be shown in addition to the equipment necessary to produce them, thus giving visitors an opportunity to see for themselves the diagnostic quality of the small films.

GERBER PRODUCTS COMPANY

FREMONT, MICH. No. 13

Ten new foods which have recently been added to the Gerber Foods will be on display in the Gerber Booth. Copies of both the professional literature and the booklets for mothers are there for your examination and will be sent to you on request.

GILLILAND LABORATORIES, INC.

MARIETTA, PA. No. 63

The Gilliland Laboratories will exhibit the Biological Products in which they specialize. Since 1882 this House has developed and produced Biological Products exclusively. New products have been added to the line only after their worth has been proved. The representative in charge of this exhibit will be glad to give information on the products produced at their Laboratories. A cordial invitation is extended to all members to visit this booth.

H. J. HEINZ COMPANY

PITTSBURGH, PA. No. 47

Those interested in prescribing for the feeding, especially of infants, older children, or adults will be interested in the Heinz exhibit where Strained and Junior Foods are displayed. Mr. L. A. Davis and Mrs. Zola Clintsman will be in attendance and will be happy to supply information on these foods. The eighth edition of the popular Heinz Nutritional Charts, containing greatly expanded charts and new data on vitamin content of foods, is ready and will be mailed on request.

HOBART MANUFACTURING COMPANY

TROY, OHIO No. 41

Hobart will display new equipment for utilizing two of the generally accepted methods for sanitizing tableware used in public eating places. The new Hobart Model AMC-5, an automatically controlled glass and dish washer, provides for a practical application of the time and temperature method—simple automatic control insures operation of both wash and rinse in accordance with predetermined standards. The Hobart application of the ultra-violet ray method for sanitizing glasses insures proper timing and promotes regular use. Patrons are served with glasses taken from the Hobart Saniray Unit at the instant of serving, eliminating any question as to whether or not the glasses have actually been sanitized. Our representative in attendance will welcome the opportunity of discussing any phase of dish washing for public eating places, with members and guests of the American Public Health Association.

HYGEIA, THE HEALTH MAGAZINE AMERICAN MEDICAL ASSOCIATION

CHICAGO, ILL. No. 80

In Booth No. 80, there will be on display copies of HYGEIA, The Health Magazine, and various books and pamphlets published by the American Medical Association. Health officers, nurses, and public health workers will find in HYGEIA informative articles on such phases of health as control of epidemics, home sanitation, medical hygiene, prenatal care, healthful recreation, and kindred subjects. Also, in this booth will be shown charts and diagrams relating to heart disease.

INTERNATIONAL BUSINESS MACHINES CORPORATION

WASHINGTON, D. C. Nos. 55, 56, AND 57

THE JONES METAL PRODUCTS COMPANY

WEST LAFAYETTE, OHIO No. 48

The Jones Metal Products Company exhibit will be devoted to the Relax Bed Pan described by many doctors as an advancement in medicine because it aids recovery. It has been accepted by the Phelan Fund and approved by the Anatomical Department of the University of California. This pan eliminates heavy lifting, solves accident and soiled linen problems, is easy to clean and handle, and assures absolute comfort for the patient.

KELLOGG COMPANY

BATTLE CREEK, MICH. No. 81

The Kellogg Company will display its complete line of ready-to-eat cereals in packages featuring the Waxtite heat-sealed inner wrap which insures the fresh crispness of the products. Samples of Pep 30% Bran Flakes, now fortified with Vitamins B_1 and D will be available. Complete information concerning the manufacture and food value of the cereals, and vitamin and calorie charts of special interest to the nurse who is diet-minded will be distributed.

THE KOLYNOS COMPANY

NEW HAVEN, CONN. No. 14

The Kolynos Company takes pleasure in announcing the acceptance of Kolynos Dental Cream for inclusion in the list of accepted dental remedies of the Council on Dental Therapeutics of the American Dental Association. Kolynos Dental Cream is a concentrated dentifrice that contains no added water. When used one-half inch on a dry brush, Kolynos produces a foamy cream in the mouth that assists the brush in cleansing and polishing the teeth without harmful abrasive action.

LEDERLE LABORATORIES, INC.

NEW YORK, N. Y. Nos. 3, 4, 5, AND 6

The identification of types and the results of serum, sulfapyridine, and the combination of drug and serum in the treatment of pneumonia are the featured subjects of Lederle's exhibit at Booths Nos. 3, 4, 5, and 6. Charts on experimental phagocytosis, temperature and pulse rates, fatality rates in New York City pneumonia control programs and average duration of the acute stage in pneumonia, based on studies of Bullowa, Finland, and others, show graphically the clinical results in pneumonia therapy with serum alone, with sulfapyridine alone, and with the combination of serum and sulfapyridine. The two other sections of the Lederle Booth deal with the diagnosis of tuberculosis with Vollmer Patch Test and with the subject of scarlet fever. A member of the Lederle staff will be on hand for consultation.

LILY TULIP CUP CORPORATION

NEW YORK, N. Y. Nos. 18 AND 20

J. B. LIPPINCOTT COMPANY

PHILADELPHIA, PA. No. 73

Among the newer Lippincott works of interest to public health workers is *Pneumonia and Its Nursing Care*, by Ensworth and Greenwood. *Your Child's Development and Guidance Told in Pictures*, by Louis Hayden Meek, Ph.D., is another new book which is gaining rapidly in popularity. Others are Zabriskie's *Mother and Baby Care in Pictures*, Hasenjaeger's *Asepsis in Communicable-Disease Nursing*, Law's *Baby Care*, and Young's *Quick Reference Book for Nurses*. These and others will be on display.

THE MACMILLAN COMPANY

NEW YORK, N. Y. Nos. 1 AND 2

At the Macmillan booths will be featured five

new books of especial interest to public health workers: *Care of Poliomyelitis,* by the National Organization for Public Health Nursing new consultant in orthopedic nursing, Jessie Stevenson; the third edition of the N.O.P.H.N. *Manual of Public Health Nursing; Public Health Administration in the United States* 2d ed. by Cornell's Dr. Wilson G. Smillie; *Community Hygiene,* by Elizabeth Soule and Christine Mackenzie; and *Getting Ready to be a Mother,* 4th ed., by Carolyn Van Blarcom and Hazel Corbin.

MERCK & COMPANY, INC.

RAHWAY, N. J. NOS. 69 AND 70

The newer chemotherapeutic developments, in which Merck & Company, Inc. has played so prominent a part, will be on display at the Merck exhibit. Among these will be Sulfapyridine, Sulfathiazole, Vitamin B_1, Riboflavin, Nicotinic Acid, and Pyridoxine (Vitamin B_6). Tryparsamide Merck and the Arsphenamines will be displayed among the other products of pertinent interest to all associated in public health work. Informative literature on all of these products will be available. Do not forget to register at the Merck booth.

MINE SAFETY APPLIANCES COMPANY

PITTSBURGH, PA. NO. 22

Both new and already established safety equipment will be on display. Some newly developed products will be: M.S.A. Ear Defenders, M.S.A. Model No. 2 Explosimeter, and the M.S.A. Metal Fume Respirator. Other items to be exhibited include: gas-detecting and indicating instruments, such as Carbon Monoxide Detector, Indicator, and Alarm; Benzol Indicator; dust-counting and sampling apparatus consisting of Midget Impinger, Electrostatic Dust and Fume Sampler, and Dust-counting Microscope; a complete line of dust respirators, gas masks, breathing apparatus, and H-H Inhalator; and miscellaneous safety products including head protection, first aid, and goggles.

NATIONAL DAIRY COUNCIL

CHICAGO, ILL. NOS. 17 AND 19

The exhibit of the National Dairy Council is a new type of display you won't want to miss seeing. The display shows how "Milk Completes Your Daily Meals." Beautiful natural-color, illuminated transparencies picture an adequate breakfast, luncheon, and dinner. Animated bars light-up consecutively to show the amounts of important food factors that a quart of milk adds to the daily meals. Illustrative material will be available at the exhibit.

THE NATIONAL DRUG COMPANY

PHILADELPHIA, PA. NO. 42

The National Drug Company presents Biologicals, Ampuls, Ampul-Vials, Pharmaceuticals, Antitoxins, Bacterial Vaccines, Smallpox Vaccine, and newer Biological products. Physicians are cordially invited to visit us.

NATIONAL LIVE STOCK AND MEAT BOARD

CHICAGO, ILL. NO. 15

The National Live Stock and Meat Board's exhibit will portray Meat as a source of the essential food elements, protein, fat, carbohydrate, calcium, phosphorus, iron, copper and six vitamins. Wax models of foods will also be displayed.

NATIONAL TECHNICAL LABORATORIES

SOUTH PASADENA, CALIF. NO. 16

This exhibit features the automatic preparation of sterilizing rinse solutions for fountains and bars through Sterimatic Fountain Sterilizers. The Sterimatic Fountain Sterilizer provides automatic chlorine and pH control for rinse water in fountains and bars. Completely automatic and tamper proof, it assures uniform concentration of stable chlorine type germicide as specified by health ordinances. Public health authorities will appreciate the increased inspection efficiency and the additional safeguards to public health made possible by Sterimatic.

NATIONAL X-RAY SURVEYS, INC.

ORANGE, N. J. NO. 62

NURSE PLACEMENT SERVICE

CHICAGO, ILL. NO. 64

Nurse Placement Service. *Sponsored by Midwest Division, American Nurses Association, Approved Bureau National Organization for Public Health Nursing.* This booth is set up as a temporary branch of the Chicago Headquarters of the Service with facilities for personal service by the Executive Director, Miss Anna L. Tittman, R.N., to employers seeking personnel and nurses or technicians seeking placement or vocational counseling. The backdrop of the booth is constructed as a casement window providing a view in model of a variety of occupational situations. Literature distributed.

PARKE, DAVIS & COMPANY

DETROIT, MICH. NOS. 31, 33, 35, 37, AND 39

Parke, Davis & Company's Modernistic Exhibit, built of white mahogany and black walnut, will occupy spaces 31, 33, 35, 37, and 39 adjacent to the registration desk. Featured in this exhibit will be antisyphilitic agents, such as Mapharsen and Thio-Bismol; various biological products, including Antipneumococcic Serum, Scarlet Fever Products, Streptococcus Antitoxin, Tetanus Antitoxin, Tetanus Gas-Gangrene Antitoxin, Meningococcus Antitoxin, Smallpox Vaccine and Typhoid Vaccine; sex hormones including Theelin and Theelol; posterior lobe preparations comprising Pituitrin, Pitocin and Pitressin; and various Adrenalin Chloride preparations. Several members of the Parke-Davis Staff, including Drs. L. T. Clark, D. K. Kitchen, and R. A. Perkins, will be in attendance.

PET MILK SALES CORPORATION

ST. LOUIS, MO. NOS. 67 AND 68

An actual working model of a milk condensing plant in miniature will be exhibited by the Pet Milk Company in Booths 67 and 68. This exhibit offers an opportunity to obtain information about the production of Irradiated Pet Milk and its uses in infant feeding and general dietary practice. A miniature Pet Milk can will be given to everyone who visits the Pet Milk booth.

PETROLAGAR LABORATORIES

CHICAGO, ILL. NO. 83

Petrolagar Laboratories, Inc., offer, in addition to samples of the five types of Petrolagar, an interesting selection of descriptive literature and complete information on the treatment of constipation. The S.M.A. Corporation, in addition to the Bovinine Company, will also be represented at Booth No. 83. Those interested in infant feeding will find new and useful facts pertaining to infants deprived of breast milk.

PHILIP MORRIS & COMPANY, LTD., INC.

NEW YORK, N. Y. NO. 76

Philip Morris & Company will demonstrate the method by which it was found that Philip Morris Cigarettes, in which diethylene glycol is used as the hygroscopic agent, are less irritating than other cigarettes. Their representative will be happy to discuss researches on this subject, and problems on the physiological effects of smoking.

RALSTON PURINA COMPANY, INC.

ST. LOUIS, MO. No. 71

Ralston Purina Company cordially invites A.P.H.A. delegates to register at Booth No. 71 for: Ry-Krisp and Ralston Wheat Cereal Samples; Allergy Diets giving food lists and special recipes for wheat, egg, and milk-free diets; Ry-Krisp Low Calorie Diets giving balanced selective food lists for the reducing patient; A brand new 16 page illustrated book on whole wheat; Charts, tables, and reports on the most recent studies of Vitamin B_1.

REXAIR, INC.

DETROIT, MICH. No. 36

Rexair, a home and institutional conditioning unit to remove dust from air and furnishings by collecting and passing dust-laden air through a swirling, turbulent body of water, employs both washing and centrifuge. Much used as a medium for vaporization of medicaments in the treatment of respiratory disorders when indicated. Small, sturdy, attractive in design, precisely manufactured and nationally distributed through factory branches.

THE W. B. SAUNDERS COMPANY

PHILADELPHIA, PA. No. 60

The W. B. Saunders Company welcomes you to its exhibition at Booth No. 60 of its complete line of books on Medicine, Nursing, and Health. Among these will be Bauer and Hull—*Health Education;* Bolduan—*Public Health and Hygiene;* Boyd—*Preventive Medicine* (New Edition); Geiger—*Health Officer's Manual;* Conrad and Meister—*Teaching Procedures in Health Education;* Bryan—*Art of Public Health Nursing;* Stokes—*Clinical Syphilology;* Stokes—*Dermatology and Syphilology* (New Edition); Pelouze—*Gonorrhea;* and many others.

THE SEALRIGHT COMPANY

FULTON, N. Y. NOS. 51, 52, AND PART OF 53

SEALTEST, INC.

NEW YORK, N. Y. NOS. 30 AND 32

E. R. SQUIBB & SONS

NEW YORK, N. Y. No. 29

Visitors attending the American Public Health Association convention are cordially invited to visit the Squibb Exhibit in Booth 29. The complete line of Squibb Arsenicals, Biologicals, and Specialties of particular interest to workers in the Public Health field will be featured, together with a number of interesting new items. Well informed Squibb representatives will be on hand to welcome you and to furnish any information desired on the products displayed.

STANLEY SUPPLY COMPANY

NEW YORK, N. Y. No. 24

Many sundry items of interest to the members of the public health profession will be exhibited. The new "Stanley" bag will be featured. There will be on display for the first time a communicable disease gown made of paper that is amazingly strong, will not rustle, and can be used over and over again.

UNITED FRUIT COMPANY

NEW YORK, N. Y. NOS. 49 AND 50

Latest Facts on Banana's Food Value

New clinical and nutritional studies on the banana have been undertaken, and the findings have been recently published. These scientific papers should be of interest to physicians, nutritionists, and other public health workers. We hope you will visit and register at our booth so that we may have the pleasure of supplying you with this new and important information concerning bananas.

WALLACE & TIERNAN COMPANY, INC.

NEWARK, N. J. NOS. 27 AND 28

BREAK-POINT Chlorination—the most recent development in taste and odor control for water works practice—will be featured at the W & T exhibit. Animated charts showing the relationship of chlorine residuals to applied chlorine, illustrating the "BREAK-POINT"—a demonstration of the method of determining the "BREAK-POINT" and case histories of successful use of the process will be featured.

WESTINGHOUSE ELECTRIC & MANUFACTURING COMPANY

NEW YORK, N. Y. NOS. 65 AND 66

Showing the Westinghouse STERILAMP—Science's latest contribution to the effective control of surface and air-borne bacterial contamination by means of selective untra-violet radiation. Bactericidal ultra-violet radiation and its uses in the field of Public Health will be described verbally and pictorially. Sanitization equipment utilizing STERILAMPS will be on display. Westinghouse invites members and visitors to Booths Nos. 65 and 66.

WISCONSIN ALUMNI RESEARCH FOUNDATION

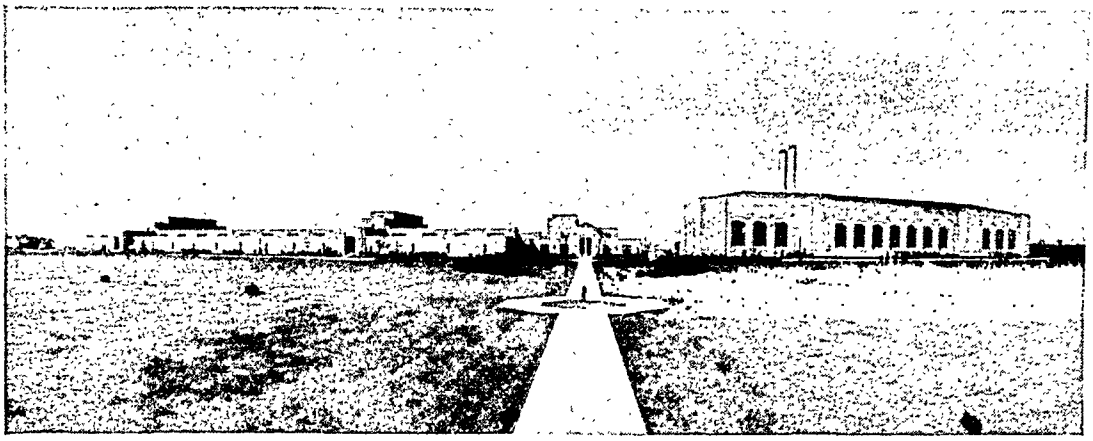
MADISON, WIS. NOS. 79 AND 80

Detroit, according to United States Weather Bureau statistics, has only 100 clear days per year. Poorest sunshine is from November to April when there are only 36 clear days in six months! These and many other facts relating to other cities and resulting Vitamin D deficiencies, as well as Vitamin D milks, foods, medicinals, and clinical literature, will be featured by the Wisconsin Alumni Research Foundation exhibit. All visiting public health officials are very cordially invited to stop at Spaces 79 and 80.

THE YEAR BOOK PUBLISHERS, INC.

CHICAGO, ILL. No. 26

The 1940 Year Book of Public Health, edited by J. C. Geiger, Director of Public Health, City and County of San Francisco, will feature the exhibit of the Year Book Publishers, Inc., Chicago. This new book will be of immediate and practical interest to everyone concerned with public health problems, because it will present, in concise and readable form, all the latest developments and important advances in the field. This new title in the 40-year-old Year Book series will be generously illustrated and will contain Dr. Geiger's personal opinions on many of the questions discussed.



Springwells Pumping Station and Filtration Plant

Points of Scientific Interest in Detroit

SCIENTIFIC trips of interest to those who will attend the Sixty-ninth Annual Meeting of the American Public Health Association in Detroit will afford visitors an unusual opportunity to learn of public health activities which three times gave Detroit first place in the Inter-Chamber Health Conservation Contest.

The newly constructed sewage plant made possible by a contribution of $9,000,000 of the total cost by the Public Works Administration embodies the best engineering thought that could be obtained. It is situated on a 72 acre tract on West Jefferson Avenue at the River Rouge and is capable of treating sewage for a population of 2,500,000 persons. More than 315,000,000 gallons of sewage daily passes through the plant at a continuous speed of 10 miles an hour. The great incinerators connected with the plant reduce 600 tons of solids to 85 tons of dry ash. There are 600 miles of huge interceptors and trunk sewers, and more than 2,000 miles of arms and lateral sewers. A trip has been arranged to the sewage disposal plant and visitors will be allowed time to study its operation.

The present Water Department of Detroit originated in 1824 with one small pump and an elevated reservoir of oak planks, and a capacity of 13,000 gallons. Hollow logs having a bore of 2 to 3¼ inches were used as distributing mains. From this humble beginning the department has developed into a gigantic organization which pumps 19,245,680,000 gallons of water to 1,916,714 persons and is capable of pumping many millions of gallons more without adding to the present equipment.

What equipment and processes are necessary to take raw river water and produce and deliver to any point in and around Detroit a clear, pure water fitted for domestic use? The water is taken from the river by means of a lagoon and intake house located at the east end of Belle Isle. From here a 15½

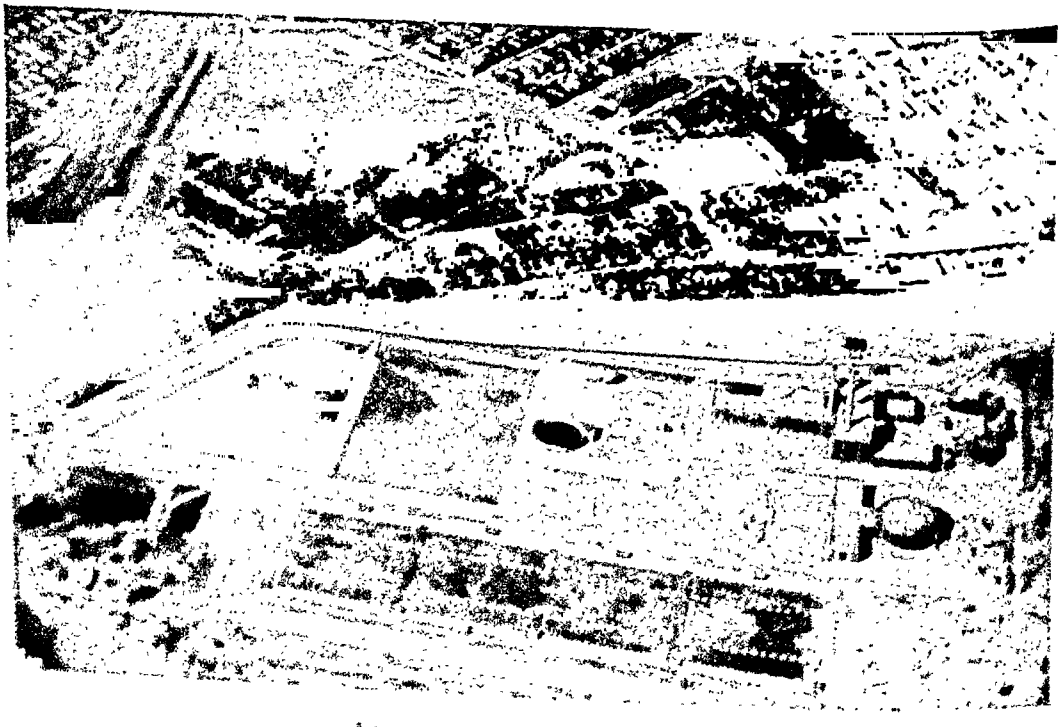
foot and 10 foot tunnel can deliver a Maximum of 1,312,000,000 gallons a day to the supply works at Water Works Park and Springwells Stations. The Water Works Park (constructed in 1923) and the Springwells (constructed in 1935) Filtration Stations consist of mixing chambers, coagulation basins, filters, and filtered water reservoirs. Raw water entering the mixing chambers is treated with chlorine and ammonium sulfate for the purpose of sterilizing the water. Aluminum sulfate is added as a coagulent. When the natural bicarbonate of the water and the aluminum sulfate have reacted to form aluminum hydroxide, a gelatinous, insoluble precipitate, the water is run slowly through settling basins where most of the suspended matter settles to the bottom. The remainder of the suspended material is removed by passing through the rapid sand filters.

The City of Detroit distributes water to 22 cities and villages and portions of 10 townships. About 4,600 miles of pipe varying in size from 4 to 72 inches are necessary for distribution to the areas using Detroit water. The average cost to the ultimate consumer is less than $0.12 per 1,000 gallons. Bacteriological and chemical analyses are made from the time it is taken from the river until the time it is to be consumed. Busses will transport visitors to the Springwells Plant as one of the scientific trips of the meeting.

Four large municipally owned incinerators for the disposal of garbage are in operation in Detroit. They are built within the city limits and are smokeless, noiseless, odorless, and economical.

How safe are workers from industrial health hazards in Detroit industries? The Industrial Hygiene Divisions of the Michigan and Detroit Departments of Health have arranged with Detroit industries to show the protection afforded in some of the leading industries.

An operation known as "metal spinning" is used in the manufacture of



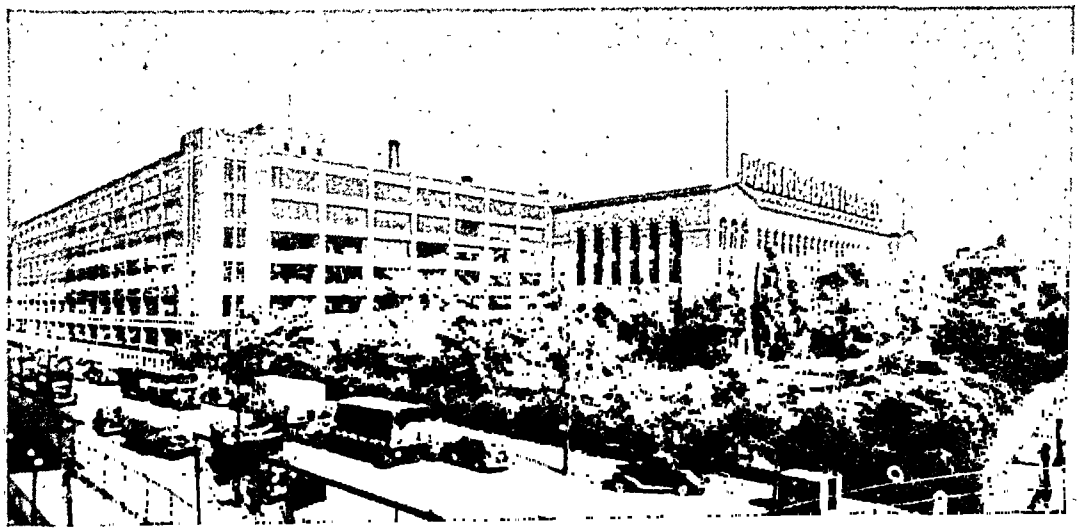
special alloy bearings for automobile and airplane engines and for wear-resistant coatings on brake drums. Several interesting installations for the control of metallic fumes and vapors from these operations may be seen in Detroit. Fascinating examples of the elimination of hazards in glass manufacture by the use of automatic handling and processing machinery are found. The rubber industry here is represented by several plants that have devised means of handling potentially harmful solvents, pigments, and compounding materials in order that workers may be protected against the development of dermatoses and respiratory afflictions. Some of these operations are considered models of safe practice, efficient production, and neat appearance. Ingenious ventilating systems can be seen on traveling furnaces handling molten metal. These systems permit the most efficient use of air in removing fumes and gases from such furnaces. The principles illustrated here can be used on many other difficult fume control problems. Solvents used to remove oil and grease from all kinds of metal products must be carefully handled to prevent poisoning or intoxication of workers. Large automatic installations of safe degreasing equipment can be seen in Detroit automobile plants.

Trips to some of the plants and consultation with industrial hygiene workers will be possible at hours which do not conflict with the sessions of the Industrial Hygiene Section.

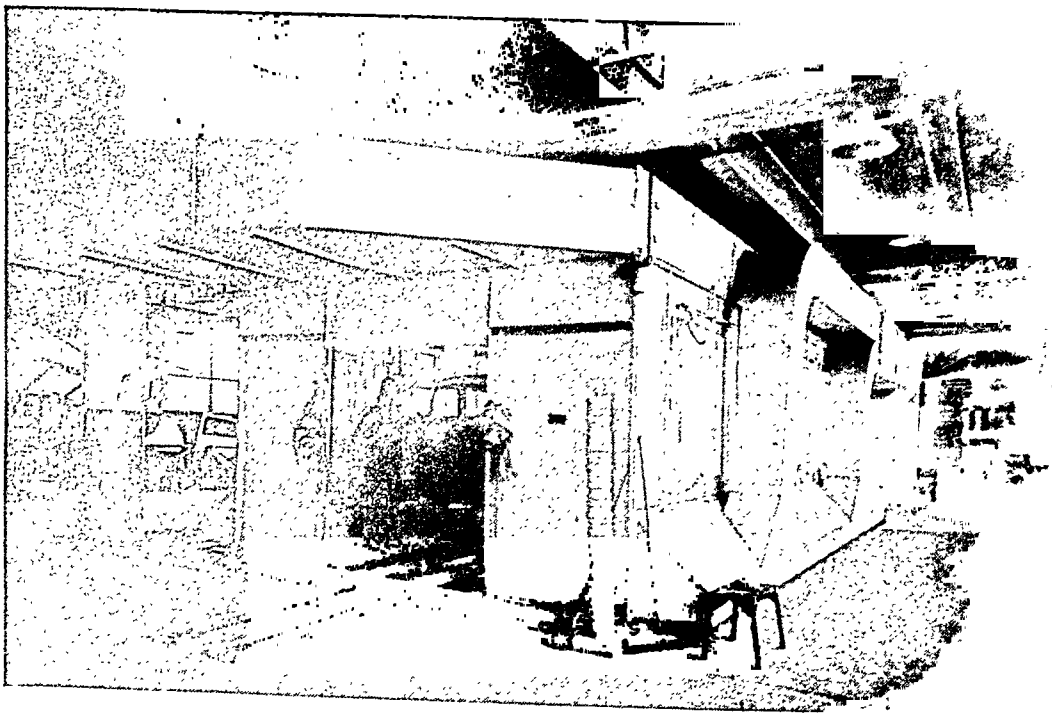
The Tuberculosis Division of the Detroit Health Department is unique in that under it, the whole control program including case finding, hospitalization, follow-up, and rehabilitation is administered.

Those who are especially interested in case finding and other field activities will want to visit the tuberculosis clinic at the Herman Kiefer Hospital where all of this work centers. A special x-ray clinic employing miniature films of the 4 x 5 inch size is located at 3125 Hastings Street where a special effort is being made to find tuberculosis in a high mortality area. Miniature film equipment is also in use in the clinic at the Herman Kiefer Hospital.

The hospitalization program may be of greater interest to others and if so a trip through the Herman Kiefer Hospital Tuberculosis Division will indi-



Parke, Davis & Company, Detroit, Mich.



Well ventilated booth for automobile body finishing

cate the up-to-date hospital care provided for tuberculosis. In conjunction with this the William H. Maybury Sanatorium at Northville, twenty-five miles out, is well worth a visit, with its 845 beds, 130 of which are for children. Here also of interest are studies going on both in laboratory and clinical research in tuberculosis.

In addition to the two hospitals owned and operated by the Health Department, there are a fluctuating number of beds used in private institutions under the supervision of the Tuberculosis Division. These arrangements vary from special wards in general hospitals to beds in private tuberculosis sanatoria which are subsidized, for the care of indigent or part pay patients, by public funds.

With this program there are available sufficient beds to avoid building up any formidable waiting list. At present there are between 2,200 and 2,300 beds occupied by county patients.

A point of special interest to visitors should be the Rehabilitation Project for recovered tuberculosis patients sponsored by the WPA, the Public Welfare Department, and the Health Department. Here some 300 or more ex-patients are engaged in work suited to their physical strength, under careful supervision. The project is located on the second floor of the building at 600 Harper Avenue.

The Detroit Edison Company erected a service building a year or two ago to accommodate several divisions of the company and to provide a high percentage of usable areas with comfortable working conditions and low maintenance cost. The building is one of much study by those who are interested in promoting the health of workers. It is air conditioned throughout, has a unique lighting system of artificial lighting, and on all floors glass block is used instead of windows.

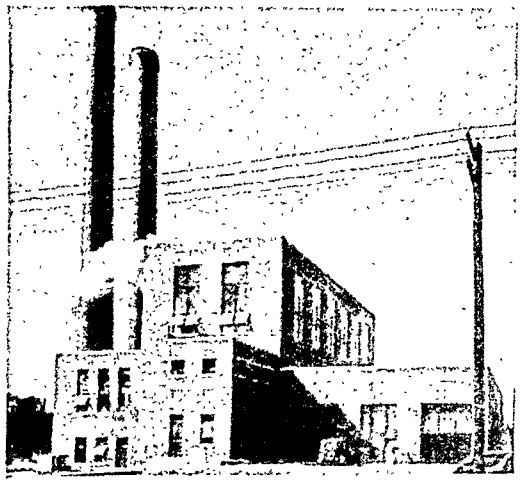
The Parke, Davis Company laboratories and pharmaceutical manufacturing plant is known throughout the

world. Here the findings of research are made usable and distributed through subsidiary plants to advance health and to combat disease.

Wayne University College of Medicine invites the members of the American Public Health Association to visit its laboratories and study the facilities and plans of a municipal medical school.

Health educators may wish to see the introduction of lessons on health as part of the course of study given in elementary adult evening school classes where those who go to learn English learn the principles of healthful living as a language lesson. The evening schools of the Detroit Public School system will be open to visitors during the week of the meeting. Likewise, the interest of Detroit foodhandlers in learning the safe practices of their occupation may be observed in the daily conferences of the Foodhandlers Division of the Detroit Department of Health.

The Teaching Center of the Nursing Division of the Health Department, located on Gratiot Avenue, is the hub from which radiates the continuing education of nurses who are employed in public health. Students from the Nursing Schools of Wayne University and the University of Michigan are sent to the center for field training as well as to Alger Center of the Visiting Nurse Association.



Wayne County Garbage and Rubbish Incinerators

In order to provide trips for those who are interested in visiting Merrill Palmer School, the W. K. Kellogg Foundation at Battle Creek, the Children's Fund of Michigan, and the laboratories of the Michigan Department of Health at Lansing, representatives will be available at Local Committee headquarters in the Hotel Book-Cadillac to make arrangements or to provide information regarding the activities of these organizations. Members of the staffs of the Detroit Public Schools will arrange for trips to special schools, and the Health Department staff will plan visits to clinics and health department activities.

ASSOCIATION NEWS

SIXTY-NINTH ANNUAL MEETING

DETROIT, MICH., OCTOBER 8–11, 1940

HEADQUARTERS

Book-Cadillac Hotel and Hotel Statler

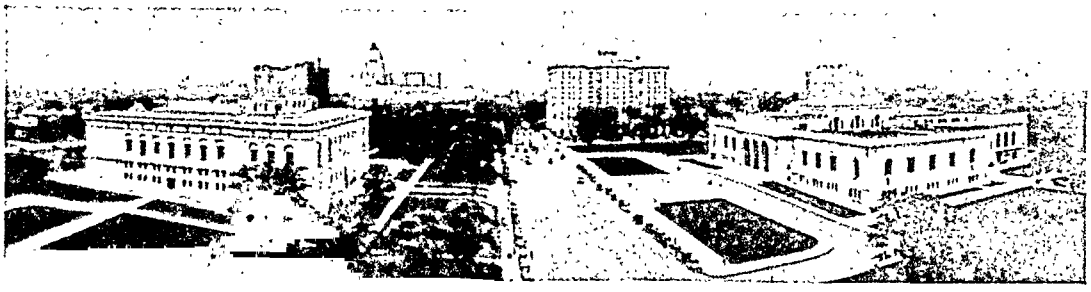
RAILROAD FARES FROM VARIOUS POINTS TO DETROIT, MICH.

AMERICAN PUBLIC HEALTH ASSOCIATION

OCTOBER 8–11, 1940

From	*One-way Pullman Travel*	*Round trip Pullman Travel*	*One-way Lower*	*One-way Upper*
Atlanta, Ga.	$22.24	$36.40	$5.80	$4.40
Baltimore, Md.	18.00	33.70	4.50	3.10
Boston, Mass.	23.30	42.75	5.25	3.60
Buffalo, N. Y.	8.40	15.10	2.10	1.45
Chicago, Ill.	8.55	16.65	2.65	1.80
Cleveland, Ohio	4.90	9.65	2.65	1.80
Dallas, Tex.	34.92	56.35	8.95	6.80
Denver, Colo.	39.61	63.25	9.45	7.20
Duluth, Minn.	21.85	37.20	5.25	4.00
Fort Worth, Tex.	34.92	56.35	8.95	6.80
Indianapolis, Ind.	8.05	15.70	2.65	1.80
Jacksonville, Fla.	32.42	51.80	8.40	6.40
Kansas City, Mo.	22.33	37.35	5.25	4.00
Louisville, Ky.	11.20	20.80	3.15	2.20
Los Angeles, Calif.	74.71	106.95	18.90	14.40
Memphis, Tenn.	22.40	37.30	5.80	4.40
Milwaukee, Wis.	11.10	20.50	3.20 *	2.35 *
Minneapolis, Minn.	20.39	35.00	4.50	3.40
Nashville, Tenn.	17.01	28.60	5.30	3.80
New Orleans, La.	32.90	52.85	8.40	6.40
New York, N. Y.	21.50	39.75	4.50	3.10
Omaha, Nebr.	23.11	39.10	5.80	4.40
Philadelphia, Pa.	19.40	36.25	4.50	3.10
Pittsburgh, Pa.	8.85	17.25	2.65	1.80
Portland, Ore.	72.89	106.95	18.40	14.00
Salt Lake City, Utah	53.34	76.45	13.40	10.20
San Francisco, Calif.	74.71	106.95	18.90	14.40
Seattle, Wash.	72.89	106.95	18.40	14.00
St. Louis, Mo.	14.90	26.30	3.15	2.20
Washington, D. C.	18.00	33.70	4.50	3.10
Montreal, Que.	19.25	34.65	4.20	2.90
Halifax, N. S.	40.60	69.25	8.95	6.70
Ottawa, Ont.	16.25	29.25	4.10	3.05
Quebec, P. Q.	24.90	44.80	6.20	4.50
Toronto, Ont.	7.75	13.95	2.10	1.45
Vancouver, B. C.	72.89	106.95	19.20	14.60

* Sent to Chicago



Detroit Art Center

DETROIT HOTELS

Hotel	Room Capacity	Single Room: Without Bath	Single Room: With Bath	Double Room: Without Bath	Double Room: With Bath
Abington	336		$3.00 up		$4.00–$5.00
Barlum	800		2.00 "		3.00– 4.00
Belcrest	400		3.00 "		4.00– 5.00
Book-Cadillac	1,200		3.00 "		5.00– 6.00
Briggs	200		2.00 "		3.00– 4.00
Detroit Leland	800		2.50 "		4.00– 5.00
Fairbairn	400	$1.25	2.50 "	$2.50	3.00– 3.50
Fort Shelby	900		2.50 "		4.00– 5.00
Imperial	200		2.00 "		2.50– 3.50
Lee Plaza	475		3.00 "		5.00– 6.00
Norton	250	1.25	2.00 "	$2.50–$2.75	3.00– 4.00
Palmetto	324		2.50 "		4.00– 5.00
Prince Edward, Windsor	250		2.50 "		4.00– 5.00
Savarine	500	1.50	2.25 "	$2.50	3.25– 5.00
Statler	1,000		3.00 "		5.00– 5.50
Tuller	800		2.00 "		3.50– 4.50
Wardell	650		3.00 "		4.50– 5.50
Webster Hall	800	1.50	2.00 "	2.50	3.50– 4.00
Whittier	850		3.00 "		4.50– 5.00
Wolverine	500		1.50 "		2.50– 4.00

Cleveland Child Health Association
Cleveland, Ohio

Selwyn D. Collins, Ph.D.
U. S. Public Health Service
Washington, D. C.

I. S. Falk, Ph.D.
Social Security Board
Washington, D. C.

Carl R. Fellers, Ph.D.
Massachusetts State College
Amherst, Mass.

A. Grant Fleming, M.D.
McGill University
Montreal, Que., Can.

Leslie C. Frank, C.E.
U. S. Public Health Service
Washington, D. C.

D. Breese Jones, Ph.D.
U. S. Department of Agriculture
Washington, D. C.

A. J. Lanza, M.D.
Metropolitan Life Insurance Company
New York, N. Y.

Katherine F. Lenroot
U. S. Children's Bureau
Washington, D. C.

Pearl McIver, R.N.
U. S. Public Health Service
Washington, D. C.

Roy J. Morton
Vanderbilt University
Nashville, Tenn.

Hugo Muench, Jr., M.D.
Rockefeller Foundation
New York, N. Y.

Nels A. Nelson, M.D.
State Department of Health
Boston, Mass.

J. T. Phair, M.B.
Provincial Department of Health
Toronto, Ont., Can.

Charles L. Pool
State Department of Health
Providence, R. I.

Samuel C. Prescott, Sc.D.
Massachusetts Institute of Technology
Cambridge, Mass.

Wilbur A. Sawyer, M.D.
Rockefeller Foundation
New York, N. Y.

Clarence D. Selby, M.D.
General Motors Corporation
Detroit, Mich.

Thomas F. Sellers, M.D.
State Department of Public Health
Atlanta, Ga.

Marion W. Sheahan, R.N.
State Department of Health
Albany, N. Y.

Elizabeth L. Smellie, R.N.
Victorian Order of Nurses for Canada
Ottawa, Ont., Can.

Felix J. Underwood, M.D.
State Health Commissioner
Jackson, Miss.

APPLICANTS FOR MEMBERSHIP

The following individuals have applied for membership in the Association. They have requested affiliation with the sections indicated.

Health Officers Section

William A. Bevacqua, M.D., City Bldg. Annex, Parkersburg, W. Va., Health Officer, Wood County Health Dept.

John M. Cruikshank, M.D., D.P.H., Chief Medical Officer, Nassau, Bahamas, B.W.I.

John W. Elder, M.D., 507 N. 12th St., Albuquerque, N. M., Deputy Dist. Health Officer, State Dept. of Public Health

Dean W. Gilman, M.D., 832 Solano St., Los Angeles, Calif., Asst. Health Officer

Edward E. Hamer, M.D., State Board of Health, Carson City, Nev., State Health Officer

Hubley R. Owen, M.D., 319 South 16th St., Philadelphia, Pa., Director, Dept. of Public Health

Laboratory Section

Alice L. Borden, M.S., 2709 East Mabel St., Tucson, Ariz., Bacteriologist and Technologist for Drs. Holbrook & Hill

Jose J. Escobar, M.D., Calle 15 4–58, Cali, Colombia, S. A., Instituto Profilactico de Cali Laboratorio

Andrew J. Estona, 201 Bunnell St., Bridgeport, Conn., Laboratory Technician, Estona's Clinical Laboratory

Charles H. Harp, M.S., Manteno State Hospital, Manteno, Ill., Bacteriologist

Alberto Restrepo, M.D., Carrera 47 50–31, Medellin, Antioquia, Colombia, S. A., Director de "Boletin Clinico"

George E. White, B.S., 200 S. E. Third St., Evansville, Ind., Chief Milk Inspector, City of Evansville

Vital Statistics Section

Kenneth F. Blankenship, 116 North State St., Springfield, Ill., Senior Tabulating Operator, State Dept. of Public Health

Engineering Section

David B. Dickson, B.A., 3210 Milby St., Wichita Falls, Tex., City Chemist

Leonard Dworsky, B.S., Mt. Sterling, Ill., Sanitary Engineer, Health Unit 9, State Dept. of Public Health

Arnold A. Prucha, A.B., Winnetka Health Dept., Village Hall, Winnetka, Ill., Sanitarian

Industrial Hygiene Section

Louis Goldberg, B.S., in Ch., 1800 W. Fillmore St., Chicago, Ill., Industrial Chemist, State Dept of Public Health

Robert Lam, B.S., Board of Health, Honolulu, T. H., Asst. Sanitary Engineer

Food and Nutrition Section

Ruth Buckner, B.S., 221 S. 20th St., Omaha, Nebr., Director, The Dairy Council

Carl A. Hoppert, Ph.D., Box 626, East Lansing, Mich., Professor of Biochemistry, Michigan State College

Public Health Education Section

Dr. Jorge Bejarano, Facultad de Medicina, Bogota, Colombia, S. A., Professor de Higiene, Facultad de Medicina

Marian L. Fahey, M.A., Ph.B., P. O. Box 634, Troy, N. Y., Executive Secretary and Health Teaching Supervisor, Rensselaer County Tuberculosis and Public Health Assn.

James O. Greenwell, Jr., M.D., Bret Harte Sanatorium, Murphys, Calif., Surgeon

Jennelle V. Moorhead, B.A., 206 Masonic Bldg., Salem, Ore., Executive Secretary, Marian County Public Health Assn.

Mary H. Peterson, A.B., 225 Greenwood St., Littleton, Colo., Secretary, Arapahoe County Public Health Assn.

L. M. Smith, M.D., Board of Education Bldg., Pittsburgh, Pa., Chief Medical Examiner, Pittsburgh Board of Education

Edith M. Wyatt, R.N., P. O. Box 663, Uniontown, Pa., Executive Secretary, Fayette County Tuberculosis Society

Public Health Nursing Section

Lilith C. Davenport, R.N., Ibapah, West Toole County, Utah. Staff Nurse, State Board of Health

Janet O. Fordyce, R.N., B.A., Court House, Boone, Iowa, Boone County Nurse

Helen Le Lacheur, R.N., M.A., 700 Brazos St., Austin, Tex., Advisory Nurse, Texas Tuberculosis Assn.

Letha V. Wells, R.N., Ext. Russell Blvd., Chariton, Iowa, Nurse, Mahaska County Nursing Service

Epidemiology Section

Harald M. Graning, M.D., U. S. Public Health Service, 14th Ave. & Lake St., San Francisco, Calif., Assistant Surgeon

Saul Jarcho, M.D., 145 Central Park West, New York, N. Y., Associate in Pathology, College of Physicians & Surgeons, Columbia Univ.

Chastina A. Kendall, R.N., B.S., Yorktown Heights, Westchester County, N. Y., Public Health Nurse, Westchester County Dept. of Health

Unaffiliated

Winifred B. Bonham, R.N., M.A., 398 Spring St., Portland, Maine, Nursing Consultant, American National Red Cross

Evelyn Johnson, A.B., Hotel Congress, Pueblo, Colo., Medical Social Worker, Div. of Public Health

Leon Price, B.A., M.S.P.H., 715 Arbor St., Ann Arbor, Mich., Student, University of Michigan

DECEASED MEMBERS

Malcolm O. Austin, M.D., San Francisco, Calif., Elected Member 1938

F. M. Houghtaling, M.D., Sandusky, Ohio, Elected Member 1920

Philip P. Jacobs, Ph.D., Morristown, N. J., Elected Member 1912, Elected Fellow 1922

Casper W. Miller, M.D., Wallingford, Pa., Elected Member 1919

Hyman I. Vener, M.D., Los Angeles, Calif., Elected Member 1934

EMPLOYMENT SERVICE

The Association Employment Service seeks to bring to the attention of appointing officers the names of qualified public health personnel and to act as a clearinghouse on employment. This is a service of the Association conducted without expense to employer or employee.

From the registry of persons available, selected announcements are published from time to time. Appointing officers may obtain lists of all registrants on request.

POSITIONS WANTED

ADMINISTRATIVE

Physician, M.P.H., Harvard, a student of maternal problems, wishes position preferably with teaching opportunities. A461

Unusually well trained physician, Dr.P.H., Harvard, background of laboratory research and experimental epidemiology, wishes opportunity to acquire field administrative experience under good auspices. A460

Administrative public health or epidemiological position is desired by well qualified physician, with M.P.H. degree, 16 years' experience as county and city health officer, and 3 years epidemiologist. A206

Physician, M.P.H., Harvard; well experienced in city and rural health administration, will consider appointment as district health officer or in city or state health department. A418

Physician, with Dr.P.H. degree, who has had 6 years' experience as public health administrator, seeks administrative position in full-time city or city-county health department. A367

Well qualified physician, with M.P.H. from Johns Hopkins, and experienced as county health officer and now assistant health officer in a large city, will consider county or city administrative position. A383

Physician, 32; M.D., 1936; postgraduate course in venereal disease control, experienced as district health officer and in organizing and publicizing syphilis control campaign; now employed in charge venereal disease clinics in metropolitan health department; seeks venereal disease control post with opportunity to organize or administer program. A437

LABORATORY

Young man, bacteriologist, especially trained in viruses and rickettsiae, and all phases of public health laboratory work; Sc.D., Johns Hopkins; now assistant state laboratory director; qualified to consider teaching, executive, administrative or research position; particularly interested in and qualified for practical laboratory methods with viruses. L451

Experienced bacteriologist, young man of 33, Sc.B., who for several years has been in charge of state laboratory doing public health and diagnostic bacteriology, immunology and serology, will consider opening. L427

Bacteriologist, serologist, B.S., M.A. degrees, 2 years' experience foods, dairy and biochemistry in public health laboratory, desires position in research or routine. L454

ENGINEERING

Public health engineer, B.S. in Sanitary Engineering from Massachusetts Institute of Technology; experienced in Massachusetts, Connecticut, and Kentucky, seeks position as sanitary or public health engineer with health department. E380

Engineer, aged 38, with 3 years' experience as district sanitation supervisor, state department of health, together with work on plumbing, heating, and ventilation, will consider position in the plumbing and heating field or state department of health. Prefers middle western or western states. E453

Engineer with good training and experience in water treatment, sewage plant operation, and in research, wishes position as superintendent. Can go anywhere. E422

HEALTH EDUCATION

Unusually well qualified young woman with background in health education and nutrition is available for immediate appointment in state or local agency. Best references. H459

HEALTH EDUCATION

Young woman with splendid educational background, graduate of Massachusetts Institute of Technology health education courses; M.A., Columbia University; seeks position in health education or nutrition. H462

ADVERTISEMENT

Opportunities Available

PUBLIC HEALTH PHYSICIANS—(a) Physician with Master's or Doctor's degree in public health for teaching appointment in department of public health; administrative as well as teaching duties; midwestern university medical school. (b) Research-minded physician with well rounded training in medicine; must be poised, convincing public speaker, although work largely investigative. (c) County health officer; southern-born physicians preferred; about $275. (d) Young physician interested in public health for county health appointment; 3 months' training provided; salary following training period $2,700. (e) Several young physicians interested in making public health their career; opportunities for advanced public health training in recognized centers interspersed with county or state health work; $2,700–$3,600, plus travel allowance of $600 yearly. (f) Public health physician, especially well trained in field of venereal diseases; state health program; maximum stipend $3,900. (g) City health physician; colorful western town having well organized department with staff of 14; $3,600 plus $300 travel allowance. (h) City health physician; city of 50,000; Atlantic Seaboard. Write PH-60, Medical Bureau, Palmolive Building, Chicago.

STUDENT HEALTH PHYSICIANS—(a) Two for fairly large colleges, beautifully located; California. (b) Resident physician; exclusive school for boys; research in school's well equipped laboratory encouraged; recent graduate; unmarried, preferred. (c) University health service; physician under 45 with teaching experience required; large state university. (d) Student health physician; internationally known school rich in tradition; duties will include medical care of men, consultations, teaching, X-ray supervision. (e) Student health physician; fairly large university; Pacific Coast; woman eligible. PH-81, Medical Bureau, Palmolive Building, Chicago.

PUBLIC HEALTH NURSES—(a) Public health nurse with B.S. degree, preferably Catholic; teaching appointment in 500 bed Catholic hospital; duties include supervision of students in the field and teaching formal classes in public health and social science. (b) Public health nurse with degree for health education directorship, county tuberculosis society, initial stipend $1,620 plus car allowance for 41 hour week; annual increases. (c) Graduate nurse with degree and public health training to direct outpatient department, 250 bed hospital; up to $200, partial maintenance; week averages 44 hours. (d) Certified public health nurse for county health work; $1,800 plus $600 travel allowance; West. (e) Certified public health nurse for appointment sponsored by Junior League; midwestern town of 50,000. PH-82, Medical Bureau, Palmolive Building, Chicago.

SCHOOL NURSES—(a) Graduate nurse with college degree, preferably 25–30, for interesting appointment as counselor in dormitory of exclusive school for girls; salary adequate to attract outstanding person; fall appointment. (b) Public school nurse; should have excellent academic background in addition to public health training; $135; Michigan. (c) School nurse qualified to teach Junior Nursing course; minimum 15 college hours in education necessary; small community not far from Chicago. (d) Public school nurse; Wisconsin lake country. (e) School nurse, certified, for district averaging 1,700 pupils; 5 nurses on staff; $125, plus car allowance. PH-83, Medical Bureau, Palmolive Building, Chicago.

BACTERIOLOGIST—(a) Department of bacteriology, eastern medical school. (b) Laboratory of experimental surgical bacteriology; $1,000; large university. (c) Laboratory of southern medical school; M.S. in bacteriology desirable. PH-84, Medical Bureau, Palmolive Building, Chicago.

BACTERIOLOGISTS — (a) Research bacteriologist; Ph.D. or D.Sc. degree required; Gentile; state department of health; $3,000. (b) Bacteriologist with training and experience public health bacteriology to direct activities of technicians examining specimens requiring microscopy; Gentile required; $2,500. PH-85, Medical Bureau, Palmolive Building, Chicago.

Situations Wanted

PUBLIC HEALTH PHYSICIAN—B.S. and M.D. degrees, eastern schools; C.P.H., Johns Hopkins School of Hygiene; 5 years chief epidemiologist State Department of Health; for further information, please write M. Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago.

PUBLIC HEALTH EXECUTIVE—Young layman who is now completing graduate training in public health, preventive medicine, and bacteriology is available for a public health position or one involving public relations; Bachelor's degree from midwestern university, 8 years' experience as public relations counsel; will go anywhere; for further information please write M. Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago.

PUBLIC HEALTH NURSE—B.A. degree; graduate of one of country's leading training schools; postgraduate training in public health and hygiene, state university; for further details, please write M. Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago.

PUBLIC HEALTH NURSE—Teacher's certificate from state teachers college; graduate training in public health nursing, University of Minnesota; 6 years, public health nurse; 3 years, chief supervising nurse, division of child hygiene; for further information, please write M. Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago.

BACTERIOLOGIST—B.S. and M.S. degrees, state university; year's training in laboratory work under direction of well known pathologist; 4 years, bacteriologist on staff large teaching hospital where she has done considerable research work in hematology; registered; for further information, please write M. Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago.

NEWS FROM THE FIELD

Denver Meeting of the Western Branch

THE 11th Annual Meeting of the Western Branch, American Public Health Association was held in Denver, Colo., June 23–27, under the Presidency of Dr. Frederick D. Stricker, State Health Officer of Oregon.

Nearly 600 persons participated in the 5 day sessions, including a number from states in the midwest not usually represented at the Western Branch sessions. The Branch area includes the 11 western states, the western Canadian provinces, and the territories of Alaska and Hawaii.

The changes in public health activities which have taken place in the 9 years since the Branch last met in Denver were apparent not only in the numbers attending but in the character of the program. Industrial hygiene, crippled children's work, nutrition, and dental hygiene were prominent features in 1940, in contrast to the limited interest shown in these subjects in 1931.

An unusually strong representation was present from the U. S. Public Health Service, the Children's Bureau, the Federal Indian Service, the Bureau of the Census, and the universities of both East and West.

The program was systematically developed under a committee of which Dr. Charles E. Smith of San Francisco was Chairman, using a variety of program devices to present modern viewpoints and new advances in fields covering many aspects of public health.

Among the participants in the program from outside the area of the Western Branch were the following:

Margaret Arnstein, R.N., Minneapolis, Minn.
Donald B. Armstrong, M.D., New York, N. Y.
Reginald M. Atwater, M.D., New York, N. Y.
Robert Beaumier, M.A., Washington, D. C.
Charles F. Blankenship, M.D., Washington, D. C.
J. J. Bloomfield, Washington, D. C.
Frank C. Cady, D.D.S., Washington, D. C.
Aubyn Chinn, Chicago, Ill.
Harold D. Chope, M.D., Dr.P.H., Boston, Mass.
Walter Clarke, M.D., C.P.H., New York, N. Y.
H. R. Crohurst, Cincinnati, Ohio
J. O. Dean, M.D., Washington, D. C.
Mayhew Derryberry, Ph.D., Bethesda, Md.
Warren F. Draper, M.D., Washington, D. C.
Halbert L. Dunn, Ph.D., M.D., Washington, D. C.
Martha M. Eliot, M.D., Washington, D. C.
Kendall Emerson, M.D., New York, N. Y.
Leslie C. Frank, Washington, D. C.
Marion C. Henderson, Washington, D. C.
Henry A. Holle, M.D., Washington, D. C.
Sam A. Kimball, Washington, D. C.
S. D. Kramer, M.D., Lansing, Mich.
Harry Mitchell, Washington, D. C.
Emory W. Morris, D.D.S., Battle Creek, Mich.
Rosalie I. Peterson, R.N., Washington, D. C.
R. H. Riley, M.D., Baltimore, Md.
James G. Townsend, M.D., Washington, D. C.
R. A. Vonderlehr, M.D., Washington, D. C.

Dr. William P. Shepard, of San Francisco, was installed as *President* of the Western Branch for the coming year. Dr. John J. Sippy of Stockton, Calif., Health Officer of the San Joaquin Health District, was named *President-elect*. W. Ford Higby, San Francisco, was reëlected *Secretary*. The Branch meeting in 1941 will be held in the area which includes Arizona and Southern California.

RESOLUTION ADOPTED BY WESTERN BRANCH, A.P.H.A., JUNE 26, 1940

WHEREAS, within the past few weeks the events of the war in Europe have aroused the people of the United States to the full realization that the future of our democratic form of government and its institutions is at stake, and

WHEREAS, the President and Congress of the United States are in full accord that a National Defense Program, larger than ever before undertaken in the history of this country, be put into operation, and

WHEREAS, every assistance should be given to our President to carry out the most effective and complete National Defense Program as outlined by him and which the Congress and the people of the United States have endorsed, therefore be it

RESOLVED, that the United States members of the Western Branch of the American Public Health Association at the Eleventh Annual Meeting held in Denver, Colo., pledge themselves with all their energy and fidelity to assist the President in carrying out the policies of the National Defense Program for the protection and preservation of the health, lives, and happiness of our American people, and be it further

RESOLVED, that we advocate and recommend that state and local health departments and their personnel be specifically designated as an essential part of the National Defense Program, not only for safeguarding the health and maintaining the physical fitness of the civilian population, but to cope with any future emergencies that may threaten the public health as they arise. Be it further

RESOLVED, that measures be taken by the Army, Navy, and Marine Corps, such as those Services deem proper and advisable to insure that the staffs of state and local health departments will not be depleted and disorganized to such an extent that they will be unable to afford health protection to the civilian population as provided for by Congress in the Social Security Act, Titles V and VI. Be it further

RESOLVED, that suitable means be provided by the military services to avoid the humiliation and embarrassment to which health department personnel of military age would be subjected if not in uniform while serving their community in an official capacity under the National Defence Program. Be it further

RESOLVED, that this act of the United States members of the Western Branch of the American Public Health Association be transmitted to the Surgeon General of the United States Public Health Service through the Parent Association, with the request that he in turn transmit it officially to the proper authorities in the War and Navy Departments. Be it further

RESOLVED, that consideration be given by the Surgeon General of the United States Public Health Service to the desirability of calling a special meeting of the Conference of State and Territorial Health Officers to discuss these and other matters relating to the organization and functioning of public health departments in connection with the National Defense Programs.

WESTERN BRANCH, A.P.H.A., ELECTS HONORARY MEMBER

AT the 11th Annual Meeting of the Western Branch, American Public Health Association, held in Denver, Colo., June 23–27, William T. Shepard, M.D., of Palo Alto, Calif., was elected an honorary member of the Branch. Dr. Shepard is the father of Dr. William P. Shepard, who was installed as President of the Western Branch at the Denver meeting, and of Dr. Charles E. Shepard of Stanford University.

Other honorary members previously elected include Hon. Herbert Hoover, of Palo Alto, Calif., and Arthur T. McCormack, M.D., of Louisville, Ky.

COLUMBIA TO GIVE DR.P.H. DEGREE

THE degree of doctor of public health has been established at the DeLamar Institute of Public Health, Columbia University College of Physicians and Surgeons, New York, N. Y., to meet the demand for specialized training in the field. The degree has been introduced at Columbia as part of the program of the Institute to supply qualified physicians to fill positions which call for specialized education of a high order.

Students who wish to matriculate for the degree must be graduates of an approved medical school and have served an internship of at least one year in a recognized hospital. The program of studies for the degree in-

cludes two years of graduate work, one of which must be spent at the Institute. If the student chooses, permission may be granted to do one year of field work in some locality other than New York.

MONTANA PUBLIC HEALTH ASSOCIATION ELECTS OFFICERS

AT its recent annual meeting, held in Bozeman, the Montana Public Health Association elected the following officers, to serve for the coming year:

President—Dr. John X. Newman, Butte
Vice-President—Helen Murphy, Butte
Secretary—Dr. William F. Cogswell, State Health Officer, Helena.

SCHOOL PHYSICIANS CONFERENCE

THE New York State Association of School Physicians held its annual conference at Saratoga Springs, N. Y., June 24.

The following officers were elected:

President—William Ayling, M.D., Syracuse
Vice-President—Edgar Bieber, M.D., Dunkirk
Secretary-Treasurer—C. Adele Brown, M.D., Oswego.

SEWAGE PURIFICATION (LONDON) SUSPENDS PUBLICATION

SEWAGE PURIFICATION, of London, has suspended publication with the June, 1940, issue, "until the termination of hostilities." This is due to shortage of paper and "cessation of means of communication with foreign countries."

It is expected that the journal will resume publication at a later date.

PERSONALS

Central States

DR. RUSSELL R. HEIM, of Minneapolis, Minn., has been appointed Health Commissioner of Hennepin County, succeeding the late DR. THOMAS T. WARHAM.

DR. FREDERICK W. HOFFBAUER, of Minneapolis, Minn., has been appointed physician on the staff of the Health Service of the University of Minnesota, effective September 16.

JOHN P. KOEHLER, M.D.,* Commissioner of Health of Milwaukee, Wis., since 1925, has resigned as of July 1 and has announced his candidacy for U. S. Senator on the Republican ticket.

EDWARD G. MCGAVRAN, M.D., M.P.H.,† formerly Health Officer of Hillsdale County, Hillsdale, Mich., and on the staff of the W. K. Kellogg Foundation, has accepted a position as Director of the State Training Center for public health workers in West Virginia, at Morgantown.

DR. BERNARD A. WATSON has resigned as head of the Student Health Service at the University of Minnesota, Minneapolis, to join the staff of the Battle Creek Sanatorium, Battle Creek, Mich.

Eastern States

DR. JOSEPH E. CANBY, of Great Barrington, Mass., has been appointed Medical Examiner of the Southern Berkshire area, succeeding DR. JOHN B. BEEBE, retired. The area includes all towns from Stockbridge to the Connecticut line and west to the New York State line.

DR. L. WHITTINGTON GORHAM, of Albany, N. Y., has been appointed a member of the New York State Public Health Council, to fill the vacancy created by the death of DR. LIVINGSTON FARRAND.* The term will expire December 31, 1942.

ROBERT C. HUME, M.D., M.P.H.,† of Olean, N. Y., recently on the staff of the Cattaraugus County Health Department, has been appointed as Assistant District State Health Officer.

WILFRED L. J. MCDONALD, M.D., M.P.H.,† of Glens Falls, N. Y., formerly an Assistant District Health Officer, has been appointed Health

* Fellow A.P.H.A.
† Member A.P.H.A.

Commissioner of Columbia County, effective April 1.

JOSEPH WEINSTEIN, M.D., M.S.P.H.,† who has served as medical consultant in social hygiene at the New York City Health Department, has been promoted to the position of Medical Officer-in-Charge and has been assigned to the Westchester-Pelham Bay Health District of the New York City Department of Health.

Southern States

DR. LYNN D. ABERNETHY, of Grenada, Miss., has been made Director of Health in Marshall County, relieving JOHN W. DUGGER, M.D.,† who had been Acting Health Officer.

DR. EDWARD S. ARMSTRONG went on duty June 15 as full-time Venereal Disease Control Officer, attached to the Chatham-Savannah Health Department, Savannah, Ga., to serve as Administrator to their Venereal Disease Control Program. Dr. Armstrong has served as City-County Health Officer at Cordele, Crisp County, Ga. The Department is sending him to Philadelphia, for a 3 months period of training, at Dr. John H. Stokes's Clinic, beginning September 15.

WALLACE BYRD, M.D.,† recently of Manchester, Ky., has been appointed Health Officer of Owen County, to succeed DR. PRICE SEWELL, JR., now of Fayette County.

DR. HERMAN T. CARTER, of Edmonton, Ky., has been appointed Director of a 2 county health unit for Green and Metcalfe Counties.

DR. HUGH L. DWYER, child specialist and member of the faculty of the University of Kansas Medical School, Kansas City, Kans., has been appointed Director of Health of Kansas City, succeeding EDWIN H. SCHORER, M.D., Dr.P.H.,* resigned.

BYRON O. GARNER, M.D.,† of Greenwood, Miss., Acting Officer in Leflore County, has been made full-time Director in Noxubee County.

DR. EDWARD C. HUMPHREY, of Somerset, Ky., has resigned as Health Officer of Pulaski County, to accept a similar position in Mercer County. DR. MILDRED E. BURTON, formerly of Berea, will succeed him in Pulaski.

RANSOM J. JONES, M.D.,† of Poplarville, Miss., has been appointed Director of the Leflore County Health Department; he has been in charge of the southeastern health district, composed of George, Greene, Stone, and Perry Counties.

JAMES H. LEVAN, C.E.,† has been transferred to the Division of Industrial Hygiene, of the National Institute of Health, Bethesda, Md., from the U. S. Quarantine Station, Miami Beach, Fla. He took the motorized Aedes aegypti Control Unit in convoy from Brownsville, Tex., where it had been detailed for the past 7 months, to the Miami Beach, Fla., Quarantine Station—the Unit has now been disbanded.

GEORGE W. MCCOY, M.D.,† for 40 years on active duty in the U. S. Public Health Service, retired June 30. Dr. McCoy is now Director of the Department of Preventive Medicine and Public Health, at the Louisiana State University School of Medicine, New Orleans, La.

DR. JAMES E. PEAVY, JR., of Austin, Tex., recently became Director of the Health Unit for San Augustine and Sabine Counties.

ALTON R. PERRY, M.D., M.P.H.,† of Laurel, Miss., has resigned as Director of the health unit in Jones County.

MILTON J. ROSENAU, M.D.,* Director of the Division of Public Health, School of Medicine, of the University of North Carolina, Chapel Hill, N. C., has been appointed first Dean.

* Fellow A.P.H.A.
† Member A.P.H.A.

DR. JAMES W. SCUDDER, of Carlisle, Ky., has resigned as Health Officer of Nicholas County.

DR. MURPHY M. SIMS, of Lexington, Miss., Acting Director of Holmes County, has been appointed Health Officer of Lafayette County, succeeding DR. JAMES H. ARMSTRONG, of Oxford, who resigned to enter private practice.

DR. RALPH SNEED, of University, Miss., has been named Director of the newly established Health Department in Marion County.

DR. JOHN W. SPIES, Dean and Professor of Public Health, University of Texas School of Medicine, Galveston, was recently elected to the Royal Society of Tropical Medicine and Hygiene in London.

WILLIAM H. F. WARTHEN, M.D., M.P.H.,* who, since 1934, has been Assistant Commissioner of Health of Baltimore, Md., has been appointed Commissioner of Health of Baltimore County, effective August 1, succeeding JOSIAH S. BOWEN, M.D.,† of Mount Washington, Md., who resigned because of serious illness after 26 years in charge of the Department. Dr. Warthen is a graduate of Johns Hopkins University; M.D., 1922, and M.P.H., 1940.

DR. EDWIN H. WEST, of Purvis, Miss., has been appointed in charge of Perry County, succeeding RANSOM J. JONES, M.D.†

JAMES H. WHITE, M.D.,† of Corinth, Miss., Acting Health Officer in Alcorn County, has been placed on a full-time basis.

DR. SAMUEL D. WHITTEN, of Greenville, Tex., has been appointed Health Officer of Hunt County, to succeed DR. LEMUEL E. GEE, resigned.

Western States

COURTNEY SMITH, M.D.,† has resigned from the Portland, Ore., City Health Department to accept a position in the Territorial Department of Health in Juneau, Alaska, where he is in charge of the maternity and child health division.

Puerto Rico

DR. TOMAS F. BLANCO, of San Juan, Puerto Rico, has been placed in charge of the new Bureau of Medical Education which has been established by the Department of Health of Puerto Rico to assist in educating the population in health matters in connection with the work of the various health units. The Department is also coöperating with the School of Tropical Medicine and the University of Puerto Rico in plans for the establishment of a school of public health in San Juan for postgraduate training of public health officials, nurses, sanitary inspectors, and laboratory technicians.

DR. MARIANO B. CABALLERO, of San Juan, Puerto Rico, has been appointed a member of the Board of Medical Examiners of Puerto Rico, to succeed DR. LUIS J. FERNANDEZ, of San Juan, whose term expired.

DEATHS

DR. WILLIAM A. EVANS, for 15 years a member of the Board of Health, Detroit, Mich., died June 9.

J. G. FITZGERALD, M.D.,* of the School of Hygiene, University of Toronto, Toronto, Ont., Canada, died recently.

FILIP C. FORSBECK, M.D.,* of the U. S. Public Health Service, died at Cincinnati, Ohio, July 13. Dr. Forsbeck, who was a graduate in medicine of the University of Chicago in 1925, was professionally connected at various times with the Massachusetts Department of Public Health, the Rockefeller Institute for Medical Research, the Michigan Department

* Fellow A.P.H.A.
† Member A.P.H.A.

of Health, and the U. S. Public Health Service. Dr. Forsbeck, who joined the Association in 1932, became a Fellow in 1935, was Secretary of the Epidemiology Section in 1937, 1938, and 1939, and at the time of his death was Vice-Chairman of the Epidemiology Section.

CONFERENCES AND DATES

American Association of Public Health Dentists. Cleveland, Ohio. September 8–9.

American College of Physicians—25th Annual Session. Statler Hotel, Boston, Mass. April 21–25, 1941.

American Dental Association. Cleveland, Ohio. September 9–13.

American Dietetic Association — 23rd Annual Convention. Pennsylvania Hotel, New York, N. Y. October 21–24.

American Hospital Association. Boston, Mass. September 16–20.

American Public Health Association —69th Annual Meeting. Book-Cadillac Hotel, Statler Hotel, Detroit, Mich. October 8–11.

American Public Works Association. Detroit, Mich. September 30–October 2.

American Society of Civil Engineers—Fall Meeting. Cincinnati, Ohio. October 16–18.

American Water Works Association.
- Michigan Section — University of Michigan Union, Ann Arbor, Mich. September 11–13.
- Rocky Mountain Section — Cosmopolitan Hotel, Denver, Colo. September 16–17.
- Western Pennsylvania Section — Castleton Hotel, New Castle, Pa. September 18–20.
- Wisconsin Section — Hotel Manitowoc, Manitowoc, Wis. October 14–16.
- Southwest Section — Mayo Hotel, Tulsa, Okla. October 14–17.
- New Jersey Section — Atlantic City, N. J. October 18–19.
- Kentucky-Tennessee Section — Lafayette Hotel, Lexington, Ky. October 21–23.
- California Section—Los Angeles Biltmore Hotel, Los Angeles, Calif. October 23–26.
- North Carolina Section—Sir Walter Raleigh Hotel, Raleigh, N. C. October 28–30.
- Four States Section—Hotel Dupont, Wilmington, Del. November 7–8.
- Minnesota Section—St. Paul Hotel, St. Paul, Minn. November 7–8.
- Missouri Valley Section—Hotel Fontenelle, Omaha, Nebr. November 13–15.

Association of American Medical Colleges. Ann Arbor, Mich. October 28–30.

Canadian Public Health Association—29th Annual Meeting. Winnipeg, Man. September 23–28.

Dairy Industries Supply Association. Atlantic City, N. J. October 21–26.

Federation of Sewage Works Associations—First Annual Convention, in conjunction with the 1940 Annual Meeting of the Central States Sewage Works Association. Hotel Sherman, Chicago, Ill. October 3–5.

Florida Public Health Association. Tampa, Fla. December.

Idaho Public Health Association—First Annual Meeting. Twin Falls, Idaho. September 9–10.

Indiana State Medical Association. French Lick Springs Hotel, French Lick, Ind. October 29–31.

Institute on Science and the Nation's Food. Wellesley College, Wellesley, Mass. October 24–26.

International Association of Milk Sanitarians. Joint Meeting with the New York State Association of Dairy and Milk Inspectors. Hotel Pennsylvania, New York, N. Y. October 17–19.

Interstate Post-Graduate Medical Assembly. Cleveland, Ohio. October 13–19.

Michigan Public Health Association. Detroit, Mich. October 8–11.

National Association of Coroners. Hotel Adelphia, Philadelphia, Pa. August 26–28.

National Chemical Exposition—sponsored by the Chicago Section of the American Chemical Society. Stevens Hotel, Chicago, Ill. December 11–15.

National Medical Association. Houston, Tex. August 12–16.

National Recreation Congress—25th. Statler Hotel, Cleveland, Ohio. September 30–October 4.

National Restaurant Association. Chicago, Ill. October 7–11.

National Safety Council. Chicago, Ill. October 7–11.

New Jersey Health and Sanitary Association, Inc. 66th Annual Meeting. Hotel Berkeley-Carteret, Asbury Park, N. J. November 15–16.

Pan-American Congress of Ophthalmology. Hotel Cleveland, Cleveland, Ohio. October 11–12.

Society of American Bacteriologists. St. Louis, Mo. December.

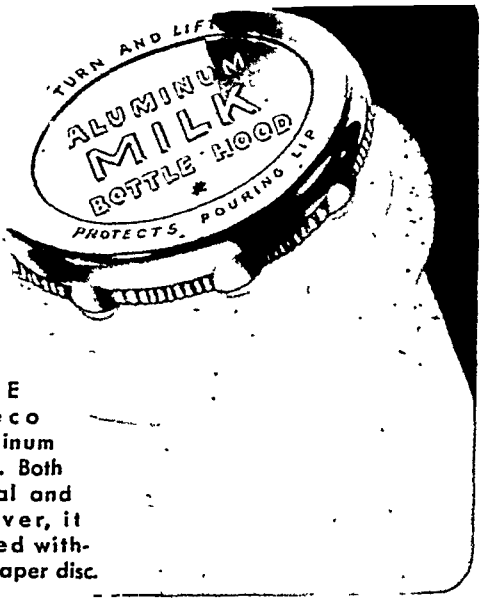
Texas Public Health Association. Fort Worth, Tex. September 30–October 2.

Tri-State Conference of Food and Health Officials. Pittsburgh, Pa. October.

United States Conference of Mayors—1940 Annual Conference. Waldorf-Astoria Hotel, New York, N. Y. September 19–21.

Foreign

Pan American Congress of Tuberculosis—Fifth. Buenos Aires, and Cordoba, Argentina. October 13–17.



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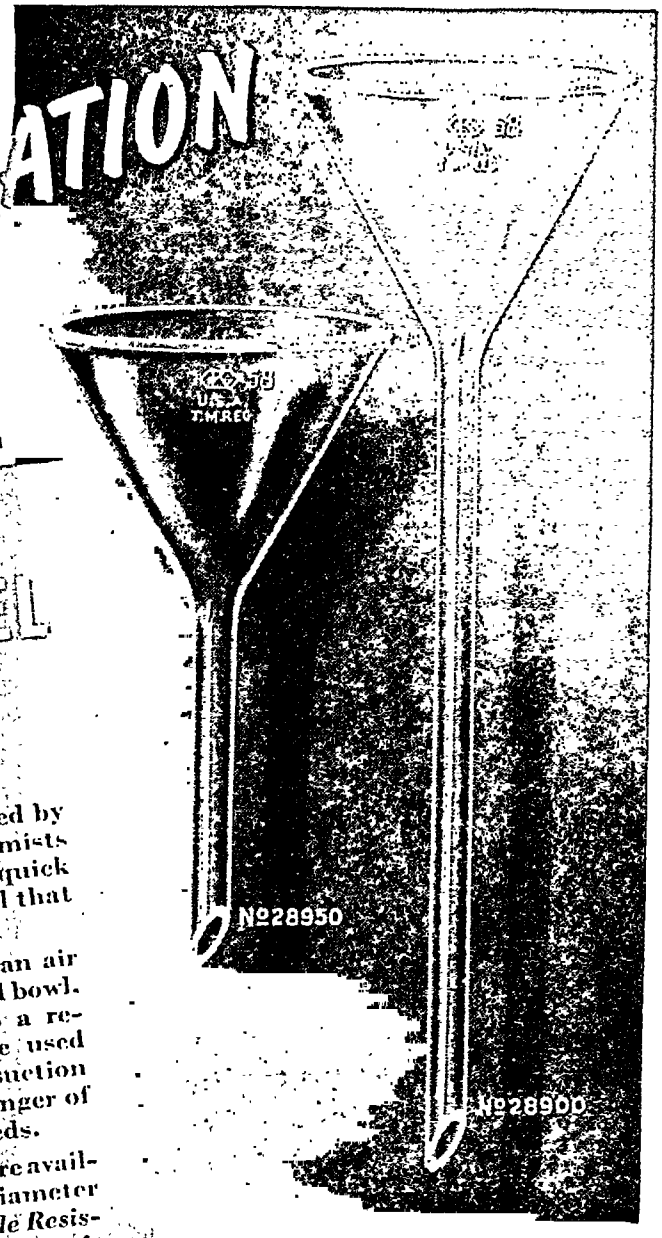
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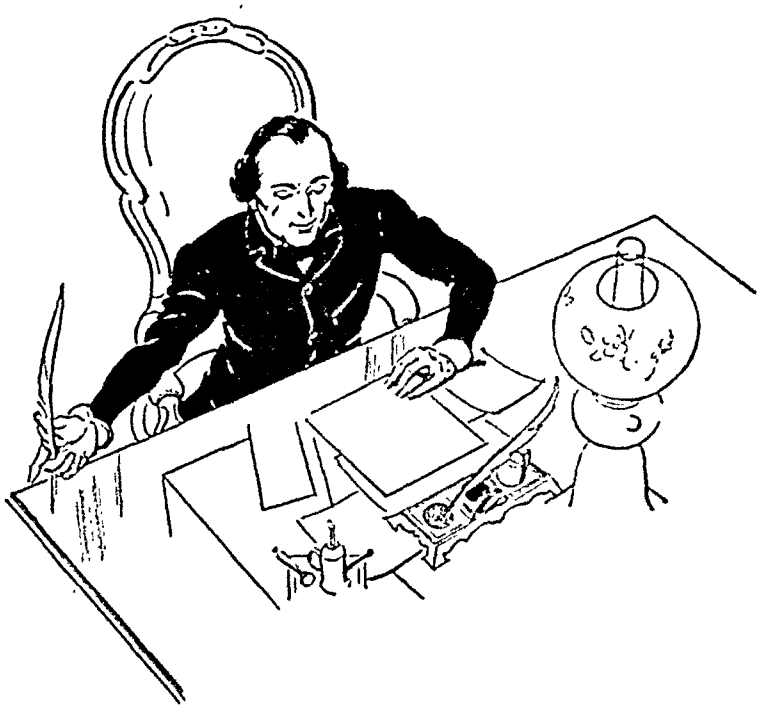
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(Disraeli, in a letter from Cairo to his sister Sarah in England, May 28, 1831)



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American Journal of Public Health
and THE NATION'S HEALTH

Volume 30 September, 1940 Number 9

An "American" Health Program*

D. B. ARMSTRONG, M.D., F.A.P.H.A., AND
W. P. SHEPARD, M.D., F.A.P.H.A.

Third Vice-President, Metropolitan Life Insurance Company, New York, N. Y.; and Assistant Secretary, Metropolitan Life Insurance Company, San Francisco, Calif.

THE current discussion of a national health program has developed almost as many views as there are viewers. The health officer sees it from the angle of prevention, and is often disposed to doubt the wisdom of mixing prevention with cure. The physician's view is based upon his clinical interest in the individual patient, and he is often skeptical of alleged general facts such as those from illness surveys. The statistician has implicit faith in his figures based upon the mass approach. The social reformer, armed with the statistician's figures, sometimes reaches very positive generalizations hard for his medical colleagues to accept. The physician points out that neither the statistician nor the social worker has ever heard a professor of medicine admonish his students that there are two words for which there is no place in medicine: "never" and "always." Then, there is the "average man," who does not fully comprehend the discussion but feels acutely the cost of illness, and especially the disaster of preventable illness and premature death. He is confused or grows impatient when told much of his illness is preventable, or that he has ready access to competent medical care whether he can pay for it or not, or that hospitals are losing money and doctors are making a poor living.

This confusion of conflicting views is worse confounded by misunderstanding and careless use of terms. For instance, "State Medicine" is freely used by those who would condemn it, yet rarely does the user attempt to define the term. Prophets announce with pontifical profundity that "socialization of medicine is coming," apparently not recognizing that it is here and has been here for decades. Every large hospital is a form of socialized medicine. Group practice, clinics, industrial medicine, health departments, nearly all salaried medical occupations, and, in fact, organized medicine itself, are forms of socialization.

Open and free discussion is one of the virtues of a democracy. We must expect that in a field so complex as health, fresh discussion will inevitably

* Read before the Western Branch American Public Health Association at the Eleventh Annual Meeting in Denver, Colo., June 27, 1940.

produce divergent views and confusion at the start, especially when we reflect that much of our public health and public welfare program in this country has developed along opportunistic lines. There is value in careful study of the multiple aspects of any problem. Serious consideration of the honest views of all concerned will in time clarify confusion and produce a wiser and sounder conclusion.

The real question which confronts us all—health officer, physician, social worker, and the public—is this: Can we attain for this country, in our own American way, greater security from disease hazards, greater social use of our unexcelled health protecting and health restoring devices, without too much loss of freedom and without political domination of medicine? If we will keep this question foremost in our minds, we are less likely to allow differences of viewpoint and confusion of terms to obstruct progress. The question is of primary importance to us all. It transcends partisan or vested interests. Its solution calls for clear thinking, calm interchange of ideas, simplicity of terms, unimpassioned discussion, and unprejudiced experimentation.

To the reasonably well informed and the unbiased, certain ideas begin to emerge which may help provide some of the answers to this problem. They are presented here without the endorsement of any organization. They represent only our individual opinions. These suggestions might constitute a tentative platform for an "American" health program—one that would utilize our resources, respect our more valued traditions, and avoid our involvement in regimentation arising from faulty, decadent, or discouraged European ideologies. Its application must certainly be partial, varied, and experimental. No "American" health program can become universal or complete over night. The planks in such a platform must be flexible to conform with accumulating experience. Their relative value will change with developments.

At the present moment there appear to be five approaches, or planks, upon which an "American" health program could be built:

1. PUBLIC HEALTH PROGRAM

First consideration should be given to a thorough-going public health and preventive medical program, including education as well as practical services. This will aim to decrease, so far as is within our power, the burden of preventable illness. Any degree of success here will cut down the necessity for the more expensive diagnostic and therapeutic facilities, all of which must be paid for, whether by fees, taxes, philanthropy, or insurance. Experience shows that prevention is soon lost sight of when the community becomes distracted with fund raising schemes to pay for the treatment of illness. Though unspectacular and often intangible, prevention is a wise investment. It requires, however, continuous exploitation and promotion, since the more successful it is, the less spectacular it becomes; and the less likely, therefore, to receive financial support. Nothing stimulates the purchase of fire engines like a bad fire, and nothing increases the health department budget like a bad epidemic. Yet, well equipped fire and health departments will prevent bad fires and epidemics. A strong and continuous public health program should be our first plank.

2. PRIVATE MEDICAL SERVICES

A high standard of private medical services must be maintained and fostered. This includes continued and increased funds for the best of medical training, both undergraduate and postgraduate. It also includes ample funds

for the research which is essential to the advance of medicine. It involves adequate compensation for the private practising physician. Even though largely supported by the fraction of the population comprising the upper economic levels private practice, medical education, and research are the germinal fields from which spring much of medicine's growth and progress. These are distinctly American and must be preserved and enhanced.

3. VOLUNTARY PREPAYMENT INSURANCE PLANS

Every encouragement should be given to a wide variety of experimentation with voluntary prepayment plans to cover hospital costs, medical costs, cash indemnity against wage loss, and combinations of the three. Experiments should include cash benefits to cover hospital and medical costs, as well as service benefits with no cash. The structure of these experimental plans should be adapted to local needs, traditions, and choices. Sponsorship may come from any responsible organized groups, such as industries, unions, farm granges, mutual benefit societies, or from medical organizations. In all cases, medical advisory leadership is essential, including proper attention to prevention. As rapidly as they prove successful, these experiments should be expanded to include as large a fraction of the employed population and its dependents as can pay its way into such a program. The more people included in such plans, the fewer will require other types of plans which are less satisfactory because they offer less freedom. Such voluntary prepayment plans might well be encouraged on a commercial group insurance basis with the well established insurance companies, in which the employer participates in the cost. Group sickness insurance with a reliable company, provided by the employer and employee jointly through pay roll deductions, should be an important link in personnel relations, and might lift many employees out of the class of "medical indigents."

4. COMBINATIONS FOR SPECIAL POPULATION UNITS

Full development of voluntary prepayment plans may still leave certain non-indigent groups uncared for, such as scattered agricultural groups, small shopkeepers, and self-employed individuals. Health and medical needs for these units can probably be met best by a combination of adequate public health services, a better implemented private medical practice, and perhaps, in some areas, hospitals and other facilities supported by local funds or by federal or state subsidy. Such subsidies should facilitate but not regiment the practice of medicine, and should vary according to local needs and choices, all the way from providing physicians with free biologicals, essential laboratory services, and access to a hospital which is publicly supported, to a minimum fixed salary or income in isolated instances.

5. STATE SUBSIDY FOR INDIGENTS AND UNEMPLOYED

Hospitalization and medical care at public expense are already fairly widely, though inadequately, available for the indigent and unemployed. They should be continued and enhanced, with medical relief under the supervision of the medical profession. Enhancement should be along the lines of providing competent medical and nursing care where practicable in outpatient clinics and in homes, and should include adequate compensation for physicians rendering care to indigents, on a locally determined fee rather than a salary basis. State or local subsidy will often be essential for areas overwhelmed by indigency, but even here use should be

made, so far as possible, of the freely chosen private practitioner, or of such medical personnel as may have been coördinated under the auspices of private medical units, or voluntary prepayment schemes.

COMMENT

All of these approaches toward disease prevention and care for illness are characteristic of, or at least not antagonistic to, the basic essentials of American democracy. They involve a minimum degree of compulsion, politicalization, and the kind of collectivism (of which compulsory sickness insurance is an example) that in so many countries has been concomitant with dictatorship.

Certainly, it would seem wise and "American" for us to place our chief emphasis on prevention; to do everything to maintain and enhance the standards of private medical practice as essential to a democracy; to experiment as fully as possible with voluntary coöperative means for the extension or socialization of medical facilities before introducing the element of compulsion; to use private medical practice and voluntary medical organizations so far as possible, even when employing state subsidies for service to indigents; and exhaustively to explore the extension of public health and medical facilities in the direction of state-salaried medical services before injecting into the American scene a compulsory, political, nonpreventive sickness insurance program. We should face and accept the necessity for the latter only as a last resort, and in so far as it may seem to be essential in meeting medical needs for those who unfortunately cannot be adequately cared for through other socially safer channels.

Criteria for the Evaluation of Printed Matter*

PHILIP S. BROUGHTON

American Film Center, New York, N. Y.†

DESPITE radio, films, exhibits, and the platform, stories in print are still the basic means by which we give systematic instruction, and the only means by which we can leave our story in permanent reference form with our customer, the public. That enduring quality of printed matter also puts an added burden of responsibility upon the profession, for errors of fact and clumsiness of presentation are preserved for repeated recognition by our colleagues. The good men do on the platform, on film, or on the ether waves is soon interred; the evil that they do in print lives after them.

Why is printed matter good or bad? Why does one carefully prepared publication fall flat and another, hastily composed, strike a chord that dominates a campaign?

The answers are complicated. They may depend upon the time and place and circumstance as well as upon factors which are discernible by examining the publication. There is no substitute for skill and originality. No formula will enable a pedestrian writer to produce best sellers.

It is a critical standard, rather than a quantitative evaluation which will show the way. One cannot offer an Abrams' machine ‡ for the diagnosis of publications. But to match Ruskin's seven lamps of architecture and Lawrence's seven pillars of wisdom, one may suggest seven critical factors by which the probable effectiveness of a printed production may be fairly judged.

1. The first question to be answered with reference to the piece of printed matter is this: *Is the publication directed to a specific audience?*

Professionals—be they doctors, educators, lawyers, or economists—have much to say. They see on every hand the gap between their comprehension and the general ignorance. They surge with interpretations which will clarify the complex and narrow the gap.

Self expression, or the urge to impart such comprehension, is small part of effective writing. Each year thousands of ambitious and hopeful scribblers deluge magazine offices with manuscripts written out of such urges. After the urge was put down on paper the writer guessed hopefully it would look good in *Harper's,* or *Collier's,* or *Hygeia,* or *Esquire,* and mailed it off, eventually to get it back, if return postage

* Read before the Health Education Section of the American Public Health Association at the Sixty-eighth Annual Meeting in Pittsburgh, Pa., October 18, 1939.

† Now with the Social Security Board, Washington, D. C.

‡ The Electronic Reactions of Abrams, later developed into the Ellis Microdynameter, were devices which their inventors alleged would enable the diagnosis of most diseases through readings on the dial of an electrical machine attached to the body of the patient. They are discussed in the *J.A.M.A.* for January 6, 1934.

was enclosed. The experienced writer decides first whom he is writing for, considers the reader he must reach, perhaps summarizes his proposal to the editor, and then writes to meet indicated specifications.

What the writer does, so does the motion picture producer in planning his pictures, or the writer of radio scripts, or the producers of cars, coats, shoes, and hats. Self expression is a luxury which keeps professionals poor and often ineffective. So it is not by caprice that I set down the rule, "*start with your audience.*" Too many pieces of health education literature indicate clearly that the reader was an afterthought.

2. Close corollary of that rule is the second question: *Has the publication a planned channel of distribution?*

The audience for which you write must be a coherent entity in the social structure of the community. It cannot be an audience of only analytical existence. One might produce in cancer education, let us say, a publication directed specifically to people with pigmented moles on normally unexposed portions of their anatomies. But since there are no organizational channels through which this group can be singled out, the publication would be difficult to circulate outside of nudist camps. The story of pigmented moles will have to be included in literature of general or other organizable distribution.

This is simply the rule of the market —and you are always writing for a market even though you may not call it that. Know your channels of distribution or you are storing up future wasted effort for the disposal of unmarketable goods. Write for your market.

3. After all, a dud may reach a selected audience through well planned channels. The next criterion, now that we have determined whom the publication will reach and how, relates to purpose: *Is the publication directed to a specific objective?*

That specific purpose may be simply to inform. A publication may inform comprehensively, as in the case of a booklet for school or college use. Or it may inform in an episodic or fragmentary way to create an awareness or recognition of a problem or a service.

In public health education, however, the more usual purpose is that of obtaining action. Sometimes the action is immediate, sometimes the purpose is to paint background, a design for future action, when and if there is occasion for action. Action may be related to personal health as in the taking of a blood test; it may relate to civic action, the support of a legislative or administrative program.

There is no matter of better or worse among these objectives. There is simply a matter of determination. A piece of literature produced to inform comprehensively is not likely to motivate; a motivating appeal may not be well designed to inform. All of which simply says: Know why you are writing, publishing, or purchasing any piece of literature you use. If you don't, don't write, publish, or purchase; you'll waste your money.

4. Selection of the amount and kinds of material to be included depends greatly upon the objective. In line with different objectives there will be many possible answers to the next question: *Does the publication include only the minimum of what the public needs to know?*

The principle of economy is an element of all good style. No publication for lay education can be "comprehensive" in a specialist's sense of that term. Yet one of the commonest criticisms expressed when copy is submitted to a physician, engineer, or any other professional is likely to be in terms of omission—"Can more substance be crammed in?"

Whatever objective is selected, draft your publication as a brief directed to attaining that objective before the bar of your particular audience. Anything which is extraneous to that "main chance," anything which is irrelevant, ornamental, or unpointed, cut as you would a cancer. Each time you halve your copy, you are very likely to double your audience. I might add, you will save in typesetting costs and often enable yourself to set in larger type and find room for illustrations.

In determining what the public needs to know, depend not merely upon what the specialists think the public *ought* to know. Find out what the man in the street already thinks and knows about the subject. In intensive fashion that determination has been made by "Gallup" poll methods in planning a New York City publication, a maternal care folder entitled, "Before the Third Month Begins."* But empirical testing of tentative copy on representative groups before final approval, noting the points which are raised, the points skimmed over, the questions asked, and the comments made will prove useful and sufficient in most cases.

5. Such empirical testing is a necessity, too, if one is to be sure that the fifth criterion is to be attained: *Is the publication written so that every person who gets it will understand?*

That understanding is something which all the other criteria will not guarantee. It is a compound of vocabulary, of explanatory formula, of human interest and vitality. For the general reader you will find no satisfactory vocabulary lists to guide you. But, put out a tentative mimeographed script and try it on fifty ordinary members of the audience you wish to reach. Sit with them, let them check words that do not seem clear or are unfamiliar (and medical writing is full of such words). Find for each a substitute word or phrase, or, if not possible, include a simple definition with your first use of such a word. Note the questions asked; ask questions yourself to be sure that understanding is there.

These are just the time honored methods. David C. Coyle tested the manuscript of "Uncommon Sense" on an old Maine fisherman. In the Public Health Service we tested the manuscript of our first syphilis folder on four different groups: clinic patients, WPA workers, college students, and inmates of an industrial school for girls. One public official has said he always tried his writing on his ten year old child and had a child every year to be sure that there would always be a ten year old to try it on; that is an excellent formula, but local conditions vary and it may not be practical for every health officer.

When such methods are used, the writer must give them meaning by standing ready to rewrite and reorganize. He may be assured he will find it necessary, but also that his final effort will be vastly improved.

6. *Is the publication medically and factually correct in every respect?* The question is not placed sixth as a matter of importance. It is simply set down as a recognized criterion, which should be so clear and so well accepted as hardly to require statement.

Some of the qualifications and possible reservations of rigorous scientific thinking must, however, be avoided. Rigidly apply Koch's postulates and one could not assure the public that

* Published by the District Health Education Demonstration of New York City Department of Health, 1939. Through a preliminary survey it was found that although most mothers registered for medical care in the seventh, eighth, and ninth months of their pregnancy, most (1) believed they *should* go early, (2) knew in a general way the purpose of early care. The publication, therefore, concentrated on emphasizing the importance of early care and describing the facilities available and the mechanics of registration—where and how. Long elaboration of obstetrical facts, which ordinarily smothers the selling point of early registration, was eliminated.

Treponema pallidum is the cause of syphilis; "there is . . . good reason to doubt that pathogenic *Treponema pallidum* ever has been cultivated on artificial media."[1] Pass any manuscript on syphilis, cancer, tuberculosis, or heart ailments to the ten outstanding researchers in the field, and you will discover how tenuous is professional agreement. Give thanks only that it is not lawyers or economists from whom you seek concensus. Nearly every administrative program is a compromise between pure science and applied science. The fact that there can be an administrative program of public health, that facilities can be set up and programs planned, suggests that there is ground for acceptable practical synthesis, which will avoid these disputes. The need for such synthesis is sometimes forgotten and popular writing confused with scientific reporting.

In syphilis education, for example, we were faced with that difficult educational problem of keeping an apparently well man returning for a year and a half to take unpleasant treatments. A statement of statistical probabilities will not lead to success. The patient needs assurance. But no honest doctor could ever promise an individual "cure." The formula which preserved both requirements depended for its truth on the *relative* success and specificity of treatment. "For no other serious disease is there *so* sure a cure." Thus, writing skill can nearly always find the turn of phrase which makes a statement ironclad in even quibbling accuracy.

7. Finally, one must turn to appearance, the form, as a matter of printing, graphic art, skilled and businesslike execution: *Is the publication professionally competent as a production?*

This question will overlap some of the previous questions in its implications. Form must not only be good. It must express the story which the copy tells. Type, picture, chart, and captions must so relate that a single entity is created. These are ideal considerations. Every musical play cannot match the music-libretto fusion of Gilbert and Sullivan, but the incongruous, inept and meaningless may be detected and rejected. One simple test will help: Is the job as well done as the advertising material you receive, and your public receives, from your competitors of the patent medicine trade or from other advertisers who compete for public attention? For colds the public will choose between your advice and that of the Smith Brothers.

If, in addition to its recognized public interest and scientific authority, public health publications achieve that standard, or surpass it, you should win. I say win, because we must never forget that we are competing in a world of frenzied subjectivity with other bids for the attention of the public.

This criterion might be expanded into seven lamps of its own, tests of good production: readability, type, layout, size, picture, caption, and low unit cost. But these are technical problems. One may, in such a paper, give critical criteria to guide administrative judgments, but methods for the production of satisfactory materials cannot be imparted so easily.

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How can these standards be attained? Can the local health officer obtain material of high professional quality for use in his health education program?

For certain audiences, perhaps the larger part of the public, the health officer can meet these standards so long as free material flows from the life insurance companies. It is sometimes weak in "audience analysis" (such criteria especially as No. 1 and No. 4), but most of that material is well written, well produced, and authoritative.

But certainly that stream will not

and should not be expected to flow forever. It has helped build health services, public and voluntary. It has demonstrated the place of printed materials in the health education program. The companies have had the funds to experiment on the necessary significant scale with form and content. As particular services grow, definite pressure should be exerted to make the accompanying educational services a part of the public responsibility. This will be a gain, however uncomfortable it may be to face just now. Private and commercial funds may then be released to experiment further on new frontiers of radio and motion pictures; the public program will have a sounder and more independent base.

It hardly seems a confident and sound basis for the health program when one goes into health departments, school systems, and voluntary agencies, from the rural areas to great industrial cities, and finds that all literature is largesse from insurance companies; nor when one finds no serious contemplation of ever securing any other source of supply. In general it is bad principle to let a legislative body get something for nothing too long. They get to expect it. We have not only to do a catch-as-catch-can job of health education; we have to build a constructive political philosophy that will secure recognition for that service as a value-received job for the community.

Does this mean local production? Except for the occasional special local problem, the answer should be in the negative. The unit cost of such production would make consistently good literature impossible. Such methods, such standards as have been suggested, contemplate secondary research, checking, rewriting, reader analysis, and a type of skilled format and planning that would be expensive on an edition of less than a few hundred thousand. Production is not normally a local problem. Some central agency must offer this service.

The technic of such central service has been very ably demonstrated by the work of the National Tuberculosis Association. In studying that association's service one must take care not to lose sight of the fact that the productive excellence of its materials has been possible only because it has developed a system for distribution before undertaking production. Other voluntary agencies have produced much good material. None, I think, have been able until quite recently to go so far in employing the resources of the graphic arts, and that, because, in going from need to production, they have not solved the intermediate steps of audience analysis and adequate distribution facilities.

In the field of venereal disease control such central production service has been developed by the U. S. Public Health Service. Folders have been prepared for specific audiences—the patient with syphilis, the patient with gonorrhea, the civic group which must be educated to the requirements of a control program, factory workers, and so forth. Professionally written and tested copy, graphic design, and good photography have gone into them. They have been produced to meet a price in quantity lots.[2] That type of work may develop further in the Public Health Service, if the revision of its publications proceeds with consideration of such standards as have been suggested herein, rather than in the matter-of-record tradition, of many government agencies.

In so far as the professional production costs—writing, design, type setting, plating, and storage—are taken care of, the dollar a hundred prices of the Government Printing Office represent economical purchase; and lower prices are offered on larger quantities. It must be admitted, however, that the swad-

dling tape of the federal government requires the Public Health Service to work under difficulties if it is to function as a central agency of supply for such materials. Public Printer A. E. Giegengack has done heroic work to transcend the paralytic rules which hamper good publishing and, thus, to give the taxpayers value received for their Government Printing Office dollar. But to a federal agency, distribution probably presents more hazards than production.

One may illustrate the obstacle to distribution with one recent case. The U. S. Public Health Service publishes as part of this service two excellent pamphlets for physicians, Supplements 5 and 6 to *Venereal Disease Information*. One of these is entitled, "The Diagnosis of Syphilis by the General Practitioner," the other, "The Management of Syphilis in General Practice." Both are from the pen of Dr. Joseph Earle Moore and with the collaboration of the Coöperative Clinical Group.

Some time ago the Bureau of Social Hygiene of the City of New York wished to buy several thousand of each for distribution to New York physicians. The money it wished to use was money received from the federal government, via the state, under the Venereal Disease Control Act.

The bureau found that under its financial controls, it could not send a check to the Superintendent of Document in Washington until the pamphlets were received.

The Superintendent of Documents could not ship the pamphlets until the money was in his hands.

So far no solution has been found; syphilis wins. When two trains meet at a crossing, both shall stop, and neither shall proceed until the other is gone.

One might add that it is important to have this situation continue. Were the Superintendent of Documents to receive discretion to negotiate such matters, were he empowered to use his intelligence as an able and responsible official, the Constitution would no doubt be subverted. We would have a "government of men—and not of laws." I refer you to any debate or editorial on federal reorganization or administrative law to establish the point.

A third possibility is the creation in the National Health Council, The American Public Health Association, The American Museum of Health or elsewhere, of a coöperative publishing service, which can develop skilled production, at cost, for any state, city, and voluntary agencies and achieve the low cost of large scale production. The work of Great Britain's Central Council for Health Education as described in the *Health Education Year Book* for 1939–1940 may constitute a lead toward such service. The writer is not familiar with its production and its achievements and, therefore, cannot elaborate on the possibility.

Wherever the service be lodged, it should make its way on merit and not constitute an exclusive production agency. Any hospital, clinic, or local health department or agency may choose to buy a syphilis pamphlet from the U. S. Public Health Service or the American Social Hygiene Association, or it may choose to produce one for itself. A central agency, if set up, should make good on price and quality in producing for its market.

Whatever the eventual solution, whether it come this year or ten years from now, there is need to think in terms of eventually assuming these responsibilities. Meanwhile, let us apply our seven lamps of criticism vigorously.

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Biological Standardisation

AT the last session of the Health Committee, Dr. Madsen reported that the number of institutes periodically receiving from the Copenhagen Institute samples of the various international standard sera is increasing and has now reached 75. The Institute is also receiving an ever-growing number of requests for toxins and cultures, which it endeavours to meet, especially in the case of laboratories that are taking up some particular production as a new departure.

The Commission on Biological Standardisation has always taken the view that the method of assay to be adopted should be left entirely to the choice of each institute. In certain cases, nevertheless, the Institute supplies particulars of the techniques it uses, being careful, however, to specify that they must not be regarded as necessarily the best. Serologists from the Argentine, Belgium, Egypt, Italy, Norway, and Thailand visited the Institute last year to acquaint themselves with the methods of assay applied at Copenhagen for purposes of serum standardisation.—*Chronicle of the Health Organisation,* League of Nations, *2,* 1 (an.), 1940.

Brilliant Green Lactose Bile and the Standard Methods Completed Test in Isolation of Coliform Organisms

A Comparative Study

CORNELIUS B. KELLY

Assistant Sanitary Chemist, New York State Conservation Department, Bureau of Marine Fisheries, Freeport, L. I., N. Y.

THE use of brilliant green lactose bile as an enrichment and inhibitory medium in the isolation of coliform organisms has been in the minds of water bacteriologists for many years.

This medium did not come into its own, however, until certain workers discovered that, like many other similar media, it is not sufficiently productive to be used as a primary inoculum.[1, 2] With this in mind, a coöperative study was undertaken by the American Public Health Association, a report of which was published[3] to determine the relative efficiency of the 4 outstanding liquid confirmatory media suggested in standard methods.[4] The results indicated the brilliant green bile confirmatory method as the most generally satisfactory of the selective procedures studied, and that it yields results which, with the possible exception of those obtained from finished waters, are usually more accurate than are those secured through the use of the " completed test " alone.

Since such results were obtained on water samples it appeared advisable to consider the use of this medium in the bacteriological examination of shellfish and shellfish-bearing waters, but before adopting the procedure as routine, a study similar to that conducted by McCrady, but using only brilliant green lactose bile, was indicated. This study, started September, 1937, and continued until May, 1939, was conducted over a span of more than 1½ years in order to determine any possible seasonal variations in comparative results, as well as to accumulate sufficient data for accurate interpretation of results.

PROCEDURE

Standard Methods require that the completed test be performed on a tube which shows gas formation from the smallest amount of water tested. It has been our observation that in a great many instances, if this practice were followed, many of these tubes would be found to react negatively, necessitating performing the completed test on tubes containing a larger amount of sample, thereby not only causing a delay of 1 day in obtaining final results but, at the end of 48 hours' incubation of the lactose tubes, many of the coliforms may have been overgrown and possibly lost. Another advantage of brilliant green is that practice has

shown that such positive gas tubes, even if kept over a period of days, still gave fairly pure cultures, were not overgrown, and could be referred to for check, if desired, without fear of a change in the culture. It has therefore been the policy of this laboratory to perform the full completed test on at least two tubes of each dilution showing gas.

In this study, parallel inoculations were made into brilliant green lactose bile (2 per cent) from all lactose broth tubes which were submitted to the completed test, and the amount of gas produced was observed after 24 and 48 hours' incubation. If gas was produced in the brilliant green tube and the colonies on eosin-methylene-blue agar were typical, this was called "agreement" and no further work was done with the brilliant green. However, if no typical colonies were produced on the E.M.B. agar from the lactose broth, and gas was produced in the corresponding brilliant green tube, inoculations were made from the brilliant green to an E.M.B. agar plate and the completed test was carried out from the colonies isolated. Conversely, when characteristic colonies were produced on E.M.B. from the lactose broth and no gas was produced in the brilliant green tube, inoculations were made from the typical colonies to brilliant green and observations for gas were made after 24 and 48 hours' incubation.

RESULTS

A complete statistical account of the results obtained is given in Table 1. The results are classified by months in order to show any seasonal variations, and the samples are divided into two classes; shellfish and water, because it was observed that quite different reactions were obtained with these two types of samples.

Lines 1 and 2 in the table are self-explanatory, being a statement of the number of samples and of gas positive tubes examined. In line 3, an example

FIGURE 1

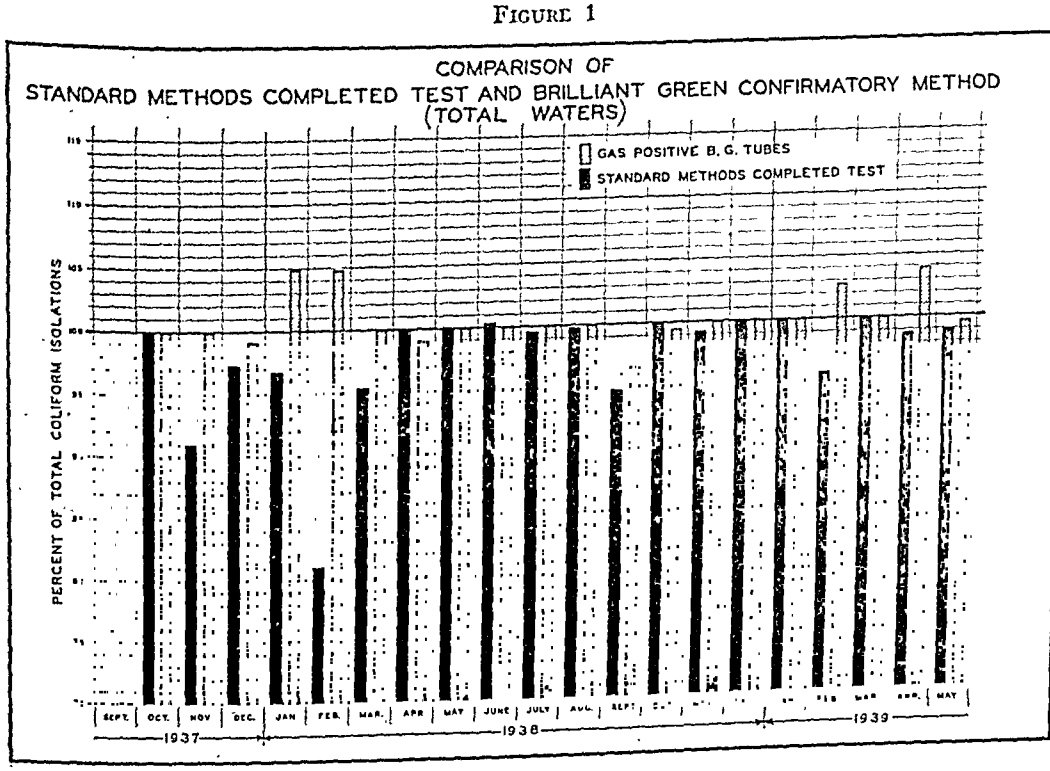


TABLE 1

Statistical Data Showing Relations between Regular Standard Methods Completed Test and Brilliant Green Bile Partially Confirmed Test

Total Shellfish Samples

Totals	1937 Sept.	Oct.	Nov.	Dec.	1938 Jan.	Feb.	Mar.	Apr.	May	June	July
1. Samples	66	105	105	85	100	75	106	107	97	109	112
2. Gas pos. lactose tubes	169	275	274	216	327	239	414	238	252	229	295
3. Tubes coliform pos. either method	164	260	225	165	155	121	178	127	181	180	246
4. Tubes B.G. gas pos.	163	261	234	164	170	120	181	126	179	181	247
5. Tubes BG pos. + SMC pos.	162	258	224	161	151	119	178	127	179	180	246
6. Tubes LB + SMC pos.	154	248	214	151	135	102	154	127	160	179	229
7. Tubes BG + SMC pos., LB + SMC neg.	10	12	11	14	20	19	24	0	21	1	17
8. Tubes BG gas neg., LB + SMC pos.	2	2	1	4	1	2	0	0	2	0	0
9. Tubes in agreement	158	260	252	195	300	215	387	237	229	225	273
10. Tubes not in agreement	11	15	22	21	27	24	27	1	23	4	22

Total Water Samples

Totals	1937 Sept.	Oct.	Nov.	Dec.	1938 Jan.	Feb.	Mar.	Apr.	May	June	July
1. Samples		28	17	59	21	77	97	105	38	533	396
2. Gas pos. lactose tubes		80	48	136	68	210	329	214	88	949	688
3. Tubes coliform pos. either method		76	33	113	63	170	128	207	77	922	677
4. Tubes B.G. gas pos.		76	33	112	66	178	128	205	77	919	677
5. Tubes BG pos. + SMC pos.		76	33	112	63	170	128	205	77	919	677
6. Tubes LB + SMC pos.		76	30	110	61	138	122	207	77	922	674
7. Tubes BG + SMC pos., LB + SMC neg.		0	3	3	2	32	6	0	0	0	3
8. Tubes BG gas neg., LB + SMC pos.		0	0	1	0	0	0	2	0	3	0
9. Tubes in agreement		80	48	132	63	170	323	212	88	946	685
10. Tubes not in agreement		0	0	4	5	40	6	2	0	3	3

Total Shellfish Samples

Totals	1938 Aug.	Sept.	Oct.	Nov.	Dec.	1939 Jan.	Feb.	Mar.	Apr.	May	Total
1. Samples	119	195	153	191	66	76	96	163	124	112	2,347
2. Gas pos. lactose tubes	309	542	343	395	150	191	421	722	433	439	6,873
3. Tubes coliform pos. either method	249	501	295	369	125	135	219	459	210	280	4,844
4. Tubes B.G. gas pos.	253	502	295	372	125	143	228	458	234	313	4,941
5. Tubes BG pos. + SMC pos.	249	501	295	369	125	134	219	458	210	279	4,824
6. Tubes LB + SMC pos.	243	486	293	369	121	128	190	379	145	253	4,460
7. Tubes BG + SMC pos., LB + SMC neg.	6	15	2	0	4	5	29	80	65	27	382
8. Tubes BG gas neg., LB + SMC pos.	0	0	0	0	0	1	0	1	0	1	17
9. Tubes in agreement	299	524	341	392	146	174	383	641	368	411	6,410
10. Tubes not in agreement	10	18	2	3	4	17	38	81	65	28	463

was taken from the work of McCrady in which there was used as a performance standard the completed test results secured through the use of both methods rather than by the old Standard Methods procedure alone. Line 4 gives the total gas positive tubes which showed gas in the confirmatory brilliant green tube, and line 5, the number of these tubes which were found to contain coliform organisms. The number of confirmations by lactose broth and the completed test is shown in line 6. Lines 7 and 8 classify the disagreements, and line 9 gives the number of gas positive tubes in which there was obtained agreement by both methods in showing the absence as well as presence of coliforms.

A study of lines 3, 4, 5, and 6 reveals a quite close agreement between the number of gas positive brilliant green tubes and the total coliform isolations, and also that the regular completed test procedure failed to isolate many of the coliforms found with brilliant green. This latter is also shown by a study of the figures in line 7. It will also be observed that very few coliforms were isolated by the regular completed test

TABLE 1 (Cont.)

Statistical Data Showing Relations between Regular Standard Methods Completed Test and Brilliant Green Bile Partially Confirmed Test

Total Water Samples

Totals	1938 Aug.	Sept.	Oct.	Nov.	Dec.	1939 Jan.	Feb.	Mar.	Apr.	May	Total
1. Samples	212	28	86	64	52	21	29	14	48	162	2,087
2. Gas pos. lactose tubes	422	59	158	128	107	51	178	49	167	299	4,429
3. Tubes coliform pos. either method	407	57	154	125	99	39	146	31	155	283	3,962
4. Tubes B.G. gas pos.	407	57	153	125	99	39	150	31	161	282	3,975
5. Tubes BG pos. + SMC pos.	407	57	153	125	99	39	146	31	155	282	3,954
6. Tubes LB + SMC pos.	406	56	154	124	99	39	141	31	153	280	3,900
7. Tubes BG + SMC pos., LB + SMC neg.	1	1	0	1	0	0	5	0	2	3	62
8. Tubes BG gas neg., LB + SMC pos.	0	0	1	0	0	0	0	0	0	1	8
9. Tubes in agreement	421	58	157	128	107	51	169	49	165	295	4,347
10. Tubes not in agreement	1	1	1	1	0	0	9	0	2	4	82

All Samples

Totals	1937 Sept.	Oct.	Nov.	Dec.	1938 Jan.	Feb.	Mar.	Apr.	May	June	July
1. Samples	66	133	122	144	121	152	203	212	135	642	508
2. Gas pos. lactose tubes	169	355	322	352	395	449	743	452	340	1,178	983
3. Tubes coliform pos. either method	164	336	258	278	218	291	306	334	258	1,102	923
4. Tubes B.G. gas pos.	163	327	267	276	236	298	309	333	256	1,100	924
5. Tubes BG gas pos. + SMC pos.	162	334	257	273	214	289	306	332	256	1,099	923
6. Tubes LB + SMC pos.	154	324	244	261	196	240	276	334	237	1,101	903
7. Tubes BG + SMC pos., LB + SMC neg.	10	12	14	17	22	51	30	0	21	1	20
8. Tubes BG gas neg., LB + SMC pos.	2	2	1	5	1	2	0	2	2	3	0
9. Tubes in agreement	158	340	300	327	363	385	710	449	317	1,171	958
10. Tubes not in agreement	11	15	22	25	32	64	33	3	23	7	25

All Samples

Totals	1938 Aug.	Sept.	Oct.	Nov.	Dec.	1939 Jan.	Feb.	Mar.	Apr.	May	Total
1. Samples	331	223	234	255	118	97	125	177	177	274	4,434
2. Gas pos. lactose tubes	731	601	501	523	257	242	599	771	600	738	11,302
3. Tubes coliform pos. either method	656	558	449	494	224	174	365	490	365	563	8,806
4. Tubes B.G. gas pos.	660	559	448	497	224	182	378	489	395	595	8,916
5. Tubes BG gas pos. + SMC pos.	656	558	448	494	224	173	365	489	365	561	8,781
6. Tubes LB + SMC pos.	649	542	447	493	220	167	331	410	298	533	8,360
7. Tubes BG + SMC pos., LB + SMC neg.	7	16	2	1	4	5	34	80	67	30	446
8. Tubes BG gas neg., LB + SMC pos.	0	0	1	0	0	1	0	1	0	2	25
9. Tubes in agreement	720	582	492	520	253	225	552	690	533	706	10,757
10. Tubes not in agreement	11	19	3	4	4	17	47	81	67	32	545

which did not produce gas in brilliant green; there being only 25 of these of a total of 8,806 coliform isolations. This should be compared with 446 isolations with brilliant green medium not obtained through the lactose broth completed test.

The relative efficiency of these two methods as a criterion of the presence of coliform organisms is expressed graphically in Figures 1, 2, and 3. In these, the results of the experimental work are expressed in terms of per cent of the total isolations by either method. With water samples, a very close correlation was obtained between the two methods, there being only 4 months during which the variation between the two methods was 5 per cent or more, and only 1 month in which the variation was greater than 10 per cent.

With shellfish samples, however, a greater variation was obtained and the general picture would indicate some factor which occurs at particular seasons of the year. It will be noted from Figure 2 that the greatest differences between the two methods were obtained

FIGURE 2

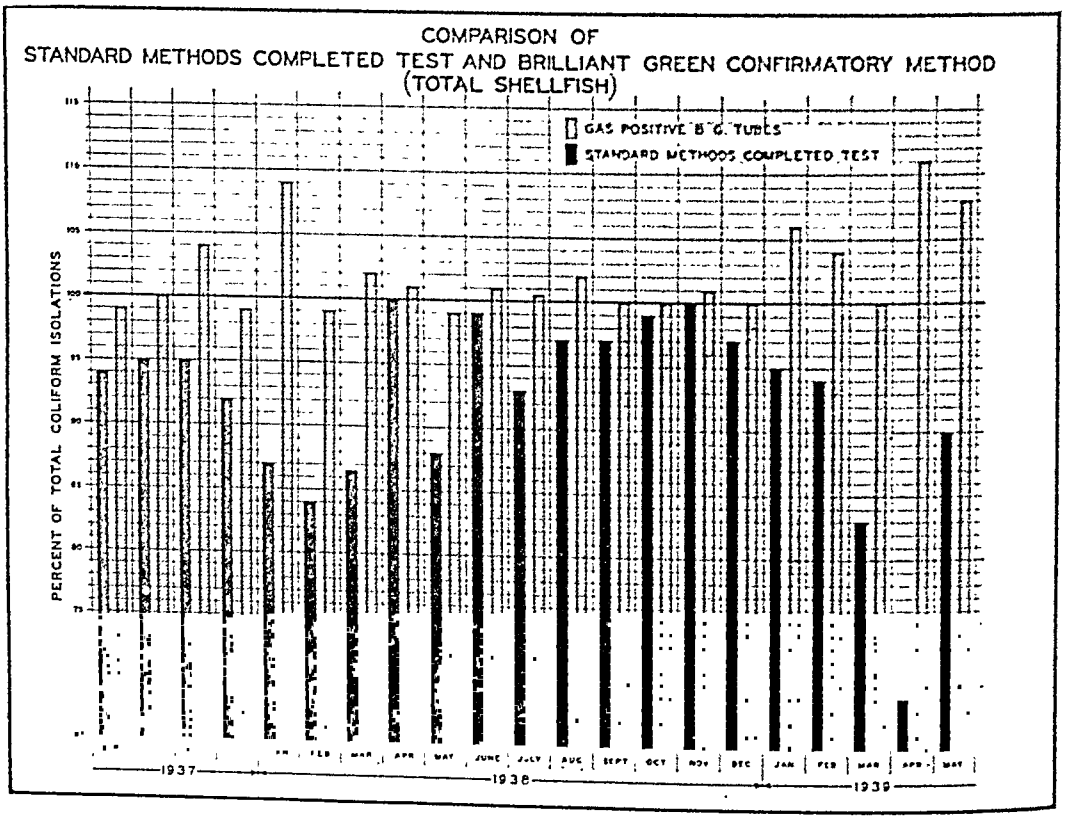
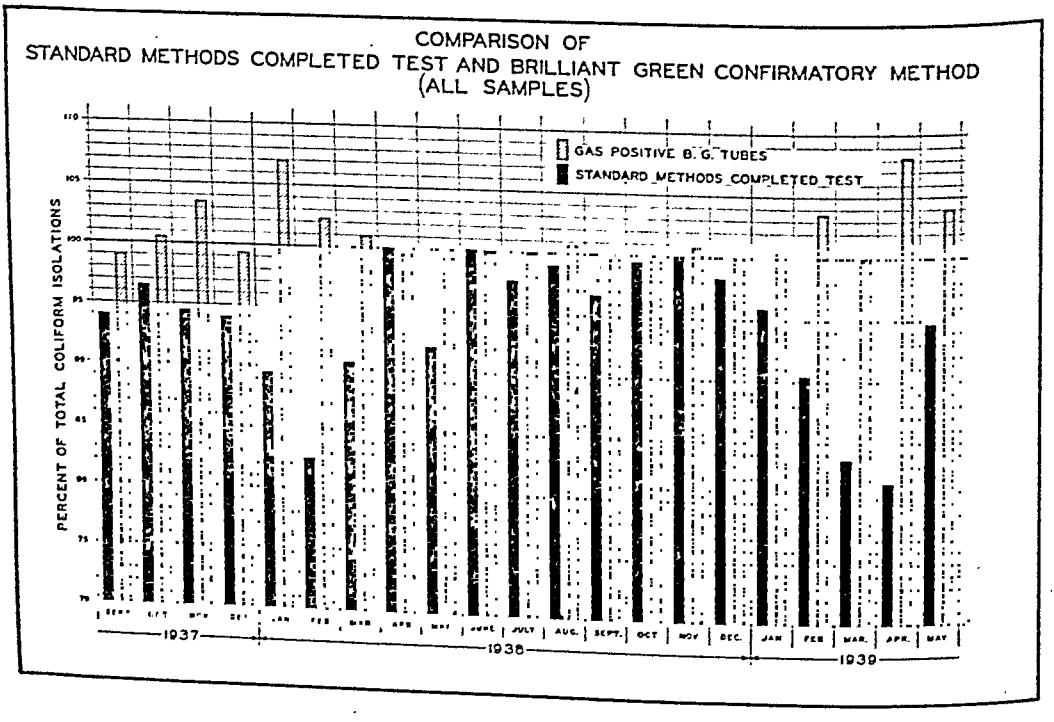


FIGURE 3



during the late winter and spring months. It will also be noted that in most cases, the figures for brilliant green were almost invariably nearer those for the total isolations than were those for the Standard Methods procedure, and that a greater number of isolations were almost always obtained through brilliant green. The latter indicates quite definitely that the brilliant green acts as an enrichment medium for attenuated forms which could not otherwise produce typical colonies on E.M.B. Figure 3 shows the results obtained on all samples, this being a total of Figures 1 and 2.

An attempt was made to isolate the organisms causing fermentation in brilliant green, but which did not later confirm as coliforms when subjected to the completed test.

A total of 89 of these cultures were studied but the reactions were so varied that no single species could be selected as predominant. In general, however, the organisms were Gram-negative, non-spore-forming bacilli which did not liquefy gelatin. They generally fermented milk, with the production of acid and gas. In a few instances a synergism was observed and when the organisms were separated, neither would ferment lactose broth or brilliant green bile medium.

SUMMARY AND CONCLUSIONS

A study has been made to determine the efficiency of brilliant green bile broth as a confirmatory medium for coliform organisms.

Comparative tests made on 2,087 water samples, of which approximately 90 per cent were sea waters, indicate that the presence of gas in brilliant green bile broth is a more accurate criterion of the presence of coliforms than the Standard Methods completed test using solid confirmatory media alone.

Similar results were obtained on the 2,347 shellfish samples but not so marked. Definite seasonal variation was observed.

Considering the total of 4,434 samples, from which 11,302 gas positive tubes were examined, gas production in brilliant green bile broth was obtained with 101.2 per cent of the total coliforms isolated by both methods while the Standard Methods completed test recovered 93.8 per cent.

If the presence of gas in brilliant green bile were considered final indication of the presence of coliform organisms, it would be possible to conduct a confirmation on all gas positive lactose tubes, thus eliminating speculation on those tubes which, because of the amount of work required, could not be confirmed by the usual completed test.

NOTE: Acknowledgment is made to M. A. Satzman and M. Lieber for their technical assistance in the collection of the data contained in this paper.

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Influence of Organic Acids, Sugars, and Sodium Chloride upon Strains of Food Poisoning Staphylococci*

T. D. NUNHEIMER AND F. W. FABIAN, PH.D., F.A.P.H.A.
Bacteriological Section, Michigan Agricultural Experiment Station, East Lansing, Mich.

THE importance of staphylococci in food poisoning has not been fully appreciated until comparatively recently. In many cases staphylococci were isolated but no particular importance was attached to their presence—all the emphasis being placed on bacteria of the Salmonella and botulinum groups. Owen [17] first called attention to the possibility of staphylococci being a cause of food poisoning when he isolated a staphylococcus from dried beef which had caused acute gastroenteritis in consumers. Eight years later Barber [1] isolated a white staphylococcus from milk which had caused gastrointestinal disturbances. Later Dack, *et al.*[7] isolated a yellow hemolytic staphylococcus which was present in considerable numbers in sponge cake which had caused illness in 11 persons. Investigations have shown beyond question that staphylococci are capable of causing food poisoning and should be one of a group of bacteria suspected in any outbreak.

In view of these facts, and since staphylococci as a group are more resistant to physical and chemical agents than are some of the asporogenic bacteria usually suspected in food poisoning, a study was made of the resistance of typical strains to some of the chemical agents commonly found in food, such as acids, sugar, and salt.

LITERATURE REVIEW

Influence of Acids:

Wolf and Harris,[26] Norton and Hsu,[16] and Bial [2] were of the opinion that the degree of acidity rather than the nature of the acid was the controlling factor in the germicidal and antiseptic actions of the acids. Kronig and Paul [15] came to the same conclusion but attributed the many exceptions of a strict parallelism to the anion or the undissociated molecule.

Paus [18] and Johannessohn,[12] working with fatty acids, concluded that there was little relation between the hydrogen ion concentration and growth, but that the kind of acid as well as the acidity was responsible for the germicidal value.

Winslow and Lochridge [25] found that the mineral acids exerted an effect proportionate to the hydrogen ion concentration, while the toxicity of the organic acids was due not mainly to hydrogen ions, but to the action of the

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undissociated molecule, varying widely, as might be expected, with the acid employed.

The germicidal action of the organic acids was studied in detail in 1932, by Reid,[21] who concluded that the resistance of *Bacillus pyocyaneus* is not constant, but varies with the kind of acid. The mono-basic acids, the least dissociated of the acids used, inhibited growth at a much lower hydrogen-ion concentration than the highly dissociated acids.

A wide difference was found to exist between the ability of an acid to exert a bactericidal effect and to inhibit growth. Acids which were strongly bactericidal frequently exhibited weak inhibiting powers in liquid media. Acetic, propionic, and butyric, which were weakly bactericidal, were among the most strongly inhibiting of all the acids tested.

It appeared that the bactericidal action of the weaker organic acids was not alone dependent upon the cations but the undissociated molecules were also active in this respect.

Influence of Salt:

In 1910 Pettersson[20] studied the influence of salt upon the bacterial flora and the decomposition of fish. With low concentrations (0–8 per cent) the flora was heterogeneous, containing both rods and cocci. Between 12 and 15 per cent concentration of salt the rods were killed while the cocci were plentiful in 18 per cent concentration after 15 days.

Karaffa-Karbutt[14] found salt possessed weak bactericidal power. Eight to 9 per cent inhibited the colon group while the pyogenic bacteria required 10 to 12 per cent. On the other hand, Falk[10] found that micrococci and sarcinae, because of their form of growth, could withstand about 15 per cent of salt.

In general, the physiological activity of the streptococci and non-spore-forming rods became greatly limited as the salt concentration approached 8 per cent, while the micrococci and sarcinae could withstand about twice this concentration.

Influence of Sugars:

Not much information is available on the effect of concentrated sugar solutions upon bacteria.

In 1909 Bitting[3] studied the effect of sugar on the molds and yeasts of tomato juice. No effect was noted until the concentration of sugar reached 25 gm. per 100 cc., where the growth occurred readily but less abundantly. The yeast was completely inhibited in concentrations above 30 gm. per 100 cc.

In the same year Pederson and Breed[19] concluded sugar was ineffective as a preservative in catsup. Even 25 per cent concentrations inhibited certain types only. It was found that 15 per cent of sugar and 3.5 per cent of salt inhibited growth of all organisms used except the yeast.

Sackett[22] studied the longevity of members of the colon-typhoid group in pure alfalfa honey. It was found that the organisms remained viable longer in the pure honey than in dilutions above 50 per cent. The failure of the organisms to die out as readily in concentrated honey as in the dilutions was believed to be due to the fact that the former is a saturated colloidal solution, and, as such, has a low osmotic pressure. In such a solution the plasmolysis would take place relatively slowly. When water was added, some of the sugar would form a molecular solution, increasing the osmotic pressure and hence the rate of plasmolysis.

Verification of Strains:

In the past few years much work has been done in an attempt to test the strains of staphylococci for production of the enterotoxic substance.

In 1936 Stritar and Jordan [23] concluded that the food poisoning staphylococci agree with other members of the group in not constituting a clearly marked division.

Woolpert and Dack,[27] comparing the enterotoxic substance with the other toxic products produced by staphylococci, obtained evidence indicating the former to be distinct from the hemolysin, dermotoxin, and killing toxin formed in the filtrates of broth cultures of these organisms.

In 1934 Chapman, *et al.*[5] showed the importance of the coagulase and hemolysis tests as measures of pathogenicity, and in 1936, the use of crystal violet agar. Later Chapman, *et al.*[4] suggested a procedure for the isolation and identification of food poisoning strains.

Briefly, the pathogenic strains of staphylococci on isolation react positively to hemolysis, pigment production, coagulase test, crystal violet test, brom thymol blue test, mannitol fermentation and lactose fermentation. On degeneration, a pathogenic strain is regarded as pathogenic as long as it produces coagulase, or if coagulase production is lost, as long as it retains both pigment and hemolysin production.

EXPERIMENTAL

In studying the factors affecting the viability of staphylococci in the acids, sugars, and sodium chloride, only those strains were used which have been isolated from food poisoning outbreaks.

ORIGIN OF STRAINS

No.	*Isolated*
85	By the New York State Department of Health (1932)
86	By the New York Department of Health (1932)
87	By the New York State Department of Health (1932)
100	From cake, 4, 23, 1932
141	From cholocate eclair, 6, 6, 1933
161	From sandwiches, 1930
166	From hard cheese, 1, 9, 1937
168	From custard eclair, 4, 28, 1937
169	From cholocate eclair, 5, 28, 1937

NOTE: The writers are indebted to Dr. E. R. Hitchner, University of Maine, for strains 85, 86, and 87; and Dr. G. M. Dack, University of Chicago for the strains 100 to 169.

These strains, together with one of *Staphylococcus albus*, were tested according to the procedure suggested by Chapman, *et al.*[4] The results are shown in Table 1.

TABLE 1

The Reactions of the Various Strains as Tested According to the Technic of Chapman, et al.

	Strain Number									
Test	*85*	*86*	*87*	*100*	*141*	*161*	*166*	*168*	*169*	*S. alb.*
Pigment	+	+	+	+	—	—	+	+	+	+
Coagulase, human	+	+	+	—	—	+	—	+	+	+
Coagulase, rabbit	+	+	+	+	+	+	+	+	+	—
Hemolysin, rabbit	+	+	+	+	—	—	+	+	+	—
Crystal violet	+	+	+	+	+	+	+	+	+	—
Brom thymol blue	+	+	+	+	+	+	+	+	+	+
Mannitol fermentation	+	+	+	+	+	+	+	—	+	+
Lactose fermentation	+	+	+	+	+	+	+	+	+	+

Table 1 indicates that all the strains were pathogenic with the exception of No. 141 and the strain of *Staphylococcus albus*. However, since some of the pathogenic strains were found to have partially degenerated, as shown by the several negative tests for coagulase, hemolysis and pigment, the typical strains chosen for use throughout the following experiments were Nos. 85, 86, 87, 168, 169 and for purposes of comparison, the non-pathogenic strain of *Staphylococcus albus*.

METHODS

Many fruits, vegetables, and fermented foods such as sauerkraut, cu-

tain considerable amounts of naturally occurring organic acids which play a rôle in food preservation. In studying the effect of acids upon staphylococci, those commonly found in foods and food products were used; namely, acetic, citric, lactic, malic, and tartaric. For comparison, benzoic and the mineral acid, hydrochloric, were used.

The medium employed was 1 per cent dextrose broth having an initial pH of 6.8–6.9. All the acids except benzoic were made up to 0.1 normal, sterilized by filtration, and added aseptically to the sterile broth. In order to obtain different concentrations, various amounts of the acids, measured in cc., were added to 10 cc. of the broth. Since benzoic acid was found to be insoluble to the extent of a 0.1 normal solution, a saturated solution was made of benzoic acid in 1 per cent glucose broth. This resulted in a 0.03 normal solution.

The test tubes were seeded with a known number of organisms, incubated at room temperature, and at intervals the number of viable organisms was determined by the plate method using standard nutrient agar.

The determination of the pH was performed according to the electrometric method, using a quinhydrone electrode.

ANTISEPTIC AND GERMICIDAL ACTION OF ACIDS ON DIFFERENT STRAINS OF STAPHYLOCOCCI

In order to study the relative inhibiting effect of each of the acids on the various strains of staphylococci, a 0.1 normal solution of each acid was made and various amounts in cc. quantities were added to 10 cc. of 1 per cent dextrose broth. The broth was then incubated for 1 week at room temperature, and subcultures were made by transferring 0.1 cc. from each tube into 10 cc. of broth and incubating for 3 days. The acids were considered to exert an inhibiting effect if there was no visible growth in the original tube, but growth in the subcultured tubes. The results are found in Table 2.

After determining the effect of the various concentrations of acids the work was repeated and at intervals the number of viable organisms was determined by plate counts using standard nutrient agar. The plates were incu-

TABLE 2

The Number of Cubic Centimeters of 0.1 Normal Acid Necessary to Exert an Inhibiting Effect upon the Different Strains of Staphylococci

No. Strain	*cc. of 0.1 Normal Acid Added to 10 cc. Broth*					
	Acetic	*Citric*	*Lactic*	*Malic*	*Tartaric*	*HCl*
85	2.0	2.5	1.0	2.0	2.0	1.5
86	2.0	3.0	1.0	2.0	2.0	1.5
87	2.0	2.0	1.0	2.5	2.0	1.5
Staph. alb.	1.5	2.0	2.0	2.0	2.0	0.75
168	2.0	4.0	1.5	3.0	1.5	1.5
169	2.0	4.0	1.5	3.0	1.5	1.5

TABLE 3

The Number of Cubic Centimeters of Each Acid Necessary to Exert a Germicidal Effect upon the Different Strains of Staphylococci

No. Strain	*cc. of 0.1 Normal Acid Added to 10 cc. Broth*					
	Acetic	*Citric*	*Lactic*	*Malic*	*Tartaric*	*HCl*
85	3	3	3	3	3	2
86	3	5	3	3	3	2
87	3	2	2	3	3	2
Staph. alb.	2	3	3	2	3	1
168	3	5	2	5	2	2
169	3	5	2	5	2	2

bated at room temperature and counted after 3 days.

Due to the disagreement among several of the previous workers as to the relative importance of the hydrogen ion concentration in actions of this type, it was advisable to determine the pH of each concentration of acid which was found to exert an antiseptic or germicidal effect. The determinations are shown in Table 4.

TABLE 4

Showing the Decreasing Order of Antiseptic and Germicidal Value of the Different Acids Together with Their Dissociation Constants

Acid	*Germicidal pH*	*Acid*	*Inhibiting pH*	*Dissociation Constant*
Acetic	4.37	Acetic	4.59	1.86×10^{-5}
Citric	3.87	Lactic	4.27	1.38×10^{-4}
Lactic	3.80	Citric	4.06	8.00×10^{-4}
Malic	3.74	Malic	3.98	4.00×10^{-4}
Tartaric	3.65	Tartaric	3.92	1.10×10^{-3}
HCl	2.43	HCl	2.94	Probably 95–97%

The results for benzoic acid show that a 1 per cent dextrose broth saturated with this acid has a pH of 3.47, and was definitely germicidal. Just what pH above this would be germicidal was not determined.

The arrangement shown in Table 4 indicates that, in general, the antiseptic and germicidal power of the acids used parallel except in the case of lactic acid, which has a stronger antiseptic action than germicidal action. The reverse is true for citric acid. It is seen that a difference exists between the ability of an acid to exert a germicidal action and to inhibit growth. This is in support of the conclusion reached by Reid.[21]

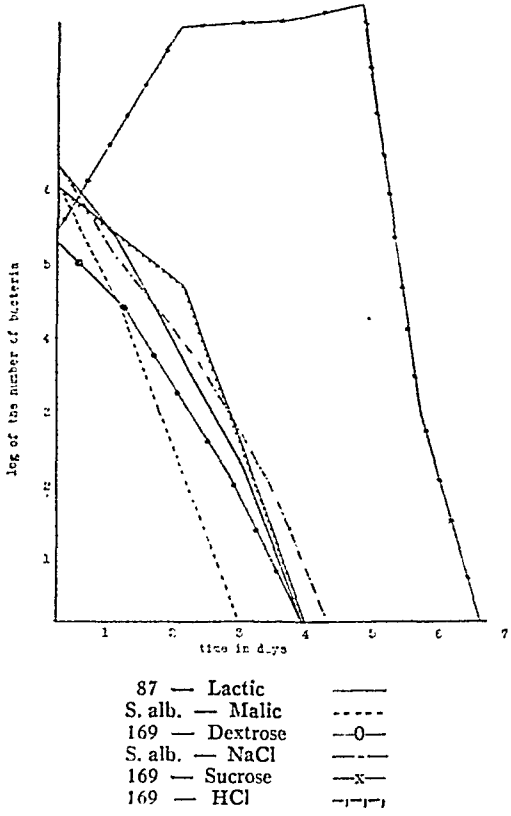
The arrangement of activity is also especially significant in view of the fact that the dissociation constants of the acids used are practically the reverse. Hydrochloric acid and tartaric acid, having the highest dissociation constants, exert the weakest germicidal and antiseptic action, while acetic acid, with the lowest dissociation constant, exerts the strongest action. This supports the findings of Clark [6] and Yaoi [28] and others who believed the un-ionized molecules are prominently concerned, since the toxic effect is not in direct proportion to the degree of dissociation.

It was found that the order of germicidal activity does not appear to be entirely consistent but varies with the strain used. This might be explained as being due to the fact that since the un-ionized molecules play a prominent rôle, it is natural that the negative radical may bring about a specificity of reaction to such an extent that one and the same acid might act differently on different organisms. In this connection Yaoi [28] found that some acids vary greatly in their accelerating or retarding effect upon bacterial growth when applied to the medium in low concentrations. The inorganic acids, HCl and HNO_3, stimulated the growth. On the other hand, organic acids on the whole have no stimulating effect with the exception of acetic and oxalic acids, which, however, have much less stimulating power than HCl and HNO_3. This stimulating effect might explain the slightly weaker antiseptic action of acetic acid as compared to some of the others tested.

The order of antiseptic potency was found to be about the same for all the organisms tested, the order being acetic > lactic > citric > malic > tartaric > hydrochloric.

It was found that one and the same organism does not react in the same way to all of the acids. Figure 2 shows that during the first 24 hours, strain number 85 is rather resistant to the action of malic (3 cc.) and tartaric acid

FIGURE 1—Typical curves showing the effect of some acids, sugars, and sodium chloride on strains of food poisoning staphylococci



(3 cc.): During this same period it is very susceptible to the action of acetic and lactic acids.

Figure 2 also indicates that the strain of *Staphylococcus albus* is more resistant to the action of acetic and tartaric acids during the first 24 hours than it is to the other acids tested. The same resistance, though to a lesser extent, was found for strain 169 to acetic acid.

In order to determine whether the resistance was truly characteristic of the organism, the resistance of strain 85 to a higher concentration of malic acid (4 cc.) was determined. Figure 2 shows that although the time required to kill all the organisms was shortened, the resistance during the first 24 hours was as great as in the lower concentration of acid. This indicates that the resistance or susceptibility of the organism in the presence of acid is, to a certain extent, specific for each acid and organism.

INFLUENCE OF SUGAR AND SODIUM CHLORIDE ON DIFFERENT STRAINS OF STAPHYLOCOCCI

In determining the effect of sugars upon the organisms, dextrose and sucrose were added to sterile sugar free broth and autoclaved at 12 lbs. pressure. Both sugar and salt concentrations were made up by volume.

The tubes were inoculated and incubated at room temperature for 1 week. An inhibiting concentration was considered as one in which there was no growth in the original tube, but growth on subculturing. The results of this experiment are found in Table 5.

From Table 5, it can be seen that the strains are comparatively resistent to the action of both sugars and salt.

About 40 to 45 per cent of dextrose was required to exert antiseptic action as compared with 50 to 60 per cent of sucrose, and 15 to 17.5 per cent of salt.

FIGURE 2—Showing the resistance of certain strains of food poisoning staphylococci to certain acids

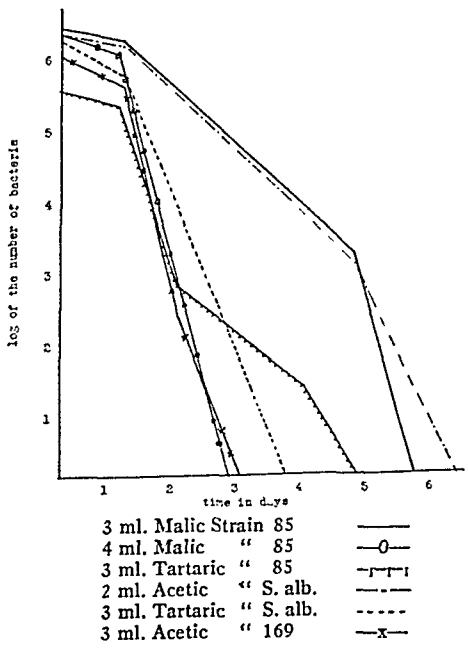


TABLE 5

The Per cent of Dextrose, Sucrose, and Sodium Chloride Exerting an Inhibiting and Germicidal Effect upon the Different Strains of Staphylococci

	Inhibiting Concentration			*Germicidal Concentration*		
Strain	*Dextrose*	*Per cent Sucrose*	*NaCl*	*Dextrose*	*Per cent Sucrose*	*NaCl*
85	35	50	17.5	40	60	20.0
86	40	50	15.0	50	60	20.0
87	40	50	15.0	50	60	20.0
Staph. alb.	35	50	20.0	40	60	22.5
168	45	60	17.5	50	70	20.0
169	45	60	17.5	50	70	20.0

The graphs in Figure 1 indicate that there is a great difference between the action of dextrose and sucrose. Vigorous growth took place even when the latter was present in large amounts. This phase was then followed by a period during which growth was materially checked although no decided reduction in numbers was apparent. Repeated observations showed that after 5 days the number of organisms rapidly decreased and at the end of 7 days all the organisms were killed.

This rapid decrease might be explained as due to the combined effect of the sucrose and the acid which was produced during the period of vigorous growth.

Dextrose, on the other hand, produced no such curve and the number of viable organisms was found to decrease continually. In this respect the salt and dextrose acted alike.

Sodium chloride exerted a germicidal effect when present in a concentration as low as 20 to 22.5 per cent (Figure 1). The order of activity, sodium chloride > dextrose > sucrose is to be explained by the fact that the action of each is, at least in part, due to plasmolysis of the cell. Since this effect is additive, that is, depends upon the number of particles or molecules present, it is natural that sodium chloride with a molecular weight of 58.5 and dextrose with a molecular weight of 180 would contain more molecules per unit weight than would sucrose the molecular weight of which is 342. Therefore, the activity should tend to decrease as the molecular weight increases.

The effect of sucrose upon several strains of food poisoning staphylococci was studied by Hucker and Haynes[11] who found that in broth containing high amounts of sucrose, vigorous growth took place during the first 24 hours. During the next 24 hours growth was materially checked, and after 5 days the numbers of staphylococci were materially reduced.

Our results agree with the conclusions reached by Hucker and Haynes. Figure 1 shows a rapid growth rate during the first 24 hours, followed by 4 days during which the numbers of bacteria remain rather constant. On the 5th day a very rapid decrease was apparent, and at the end of 7 days all the organisms were killed.

The action of sodium chloride, as shown by Figure 1, bears a closer resemblance to the acid curves than to those of sucrose. The action of the organic acids is attributed to the specific molecule and the specific potency of both ions, while the effect of sucrose is principally one of plasmolysis. Hence, the appearance of the curves indicates the importance of the potency of the ions in the action of sodium chloride. This conclusion supports that reached by Eisenberg,[8] Fabian and Winslow,[9] and others who have indicated that the action of a salt is a

function of the action of both ions as well as the osmotic pressure involved.

EFFECT OF MIXTURES OF ACID WITH SUGARS, AND ACID WITH SODIUM CHLORIDE

After determining the concentration of acids, sugars, and sodium chloride exerting an inhibitive effect, the effect of mixtures of acid with sugars, and acid with sodium chloride was determined.

The broth was made up as described with varying amounts of dextrose, sucrose, or sodium chloride. To 10 cc. amounts was added the cc. of acid found to exert an inhibiting effect (given in Table 2), and the resulting concentration of dextrose, sucrose, or sodium chloride calculated.

In the same manner one-half the inhibiting concentration of acid was added to varying amounts of sugars and salt.

DISCUSSION

Pederson and Breed [19] have shown that a combination or association of various germicidal and inhibiting substances might take place when each agent in the combination is used in a per cent which, when alone, is not sufficient to bring about such action. With this in mind mixtures of sugars and acid, and mixtures of salt and acid were prepared.

It was found that dextrose in low concentrations (5 to 17 per cent) was able to bring about a germicidal effect within 7 days in combination with an inhibiting concentration of acid. In general, less dextrose was required to bring about a germicidal effect with acetic and hydrochloric than with the other acids (Table 6). On the other hand, when one-half the inhibiting concentration of acid was used, the amount of dextrose necessary to bring about a germicidal effect was about the same for all the organisms and acids (Table 7).

With the inhibiting concentration of acid, sodium chloride was more effective with HCl than with the other acids under consideration. Five per cent exerted a germicidal effect while 10 to 12 per cent was required for the other acids (Table 6).

In the presence of the inhibiting amount of acid, sucrose was effective at a concentration of 20 to 30 per cent with hydrochloric acid, while with the other acids, the amount was somewhat higher, being 30 to 40 per cent (Table 6).

TABLE 6

The Average Amount of Dextrose, Sucrose, and Sodium Chloride in Per cent to Bring about a Germicidal Effect when Added to the Inhibiting Concentration of Acid

	Acid						Per cent Reduction
	Acetic	Citric	Lactic	Malic	Tartaric	HCl	
Dextrose	12	17.0	15	17.0	17	5	60
Sucrose	40	34.0	40	35.0	37	26	50
NaCl	11	11.6	10	9.2	10	5	50

TABLE 7

The Average Amount of Dextrose, Sucrose and Sodium Chloride in Per cent Required to Bring about a Germicidal Effect when Added to One-half the Inhibiting Concentration of Acid

	Acid						Per cent Reduction
	Acetic	Citric	Lactic	Malic	Tartaric	HCl	
Dextrose	25	24	25.0	25	25.0	25	50
Sucrose	52	..		..		..	20
NaCl	16	15	13.4	14	13.8	15	30

When the inhibiting concentration of the acid was reduced one-half, sucrose was not very effective in that 50 to 55 per cent was required to exert germicidal action (Table 7).

CONCLUSIONS

1. Although the action of the highly dissociated mineral acid is due mainly to the hydrogen ion concentration, the organic acids exerted a germicidal and antiseptic effect disproportionate to the hydrogen ion concentration produced. Therefore, it is apparent that the observed effects are due to factors in addition to the hydrogen ion, presumably either the un-ionized molecule or the anion or both.

2. The difference in the action of the various organic acids upon one and the same strain of staphylococci is believed to be due to a specificity of reaction likewise brought about by either the anion or undissociated molecule, or both.

3. The decreasing order of germicidal action of the acids was found to be acetic >citric>lactic>malic>tartaric>hydrochloric.

4. The decreasing order of antiseptic action was found to be acetic>lactic>citric> malic>tartaric>hydrochloric. In this connection it is interesting to note that citric and lactic acids change places in their antiseptic and germicidal potency.

5. Sodium chloride in a concentration of 15 to 20 per cent exerted an inhibiting effect while a 20 to 25 per cent concentration was definitely germicidal.

6. Dextrose exerted an inhibitive effect in concentrations of 30 to 40 per cent and a germicidal effect at 40 to 60 per cent.

7. Sucrose is less active than either dextrose or sodium chloride since a concentration of 50 to 60 per cent was required for inhibition and 60 to 70 per cent for germicidal action.

8. There was a great difference in the action of dextrose and sucrose upon the staphylococci. During the first 24 hours vigorous growth took place in sucrose even when it was present in concentrations as high as 70 per cent. This phase was followed by 4 days during which the number of viable organisms remained nearly constant. On the 5th day the number of organisms rapidly decreased until the 7th day when all the organisms were dead. With dextrose the germicidal action was apparent at once and uniform throughout.

9. In considering a mixture of sugars and acid, it was found that dextrose was more effective than sucrose in lower concentrations of acids. Neither of the sugars was as efficient as sodium chloride in acid, however. The amount of dextrose which was required to exert a germicidal action could be reduced 50 per cent when used in the presence of one-half the inhibiting concentration of acid. On the other hand, sodium chloride and sucrose, could be reduced only 30 and 20 per cent respectively and still bring about a germicidal effect.

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University of Pennsylvania Bicentennial Conference — September 16-22

A BICENTENNIAL Conference will be held by the University of Pennsylvania, beginning September 16 and ending September 20, 1940, as part of the program marking the observance of the two hundredth anniversary of the University's origin. Membership in the Conference will be by application and is open, within the limit of accommodations, to members of the staffs of invited institutions and organizations.

The program of the Conference will consist of lectures and papers by a group of distinguished European and American scholars and leaders in the various fields of science and thought. The offerings will represent the broad interests and significant contributions to learning. In the field of the Humanities, the Symposia are planned to bring out the continuity of culture. In other fields they will reveal the trends of modern thought and the advances of science. Each paper is on a topic upon which the speaker's published writings and researches give him a peculiar right to speak.

An officer for each division will be appointed to serve the demand of small groups who may desire to meet for informal discussion of questions arising out of the general Symposia.

Among the speakers will be a number who are American Public Health Association members. These will include:

Louis I. Dublin, Ph.D.
Conrad Arnold Elvehjem, Ph.D.
Kendall Emerson, M.D.
Thomas Francis, Jr., M.D.
The Honorable Herbert Clark Hoover
Colonel Raymond Alexander Kelser, D.V.M., Ph.D.
Henry Klein, D.D.S., Sc.D.
Thorvald Madsen, C.B.E., M.D., LL.D.
Elmer Verner McCollum, Ph.D., Sc.D., LL.D.
John Robbins Mohler, V.M.D., Sc.D.
Carroll Edwards Palmer, M.D., Ph.D.
Thomas Milton Rivers, Sc.D., M.D.
Wilbur Augustus Sawyer, M.D.
Richard Harrison Shryock, Ph.D.

Observations on the Durability of Mottled Teeth

MARGARET CAMMACK SMITH AND H. V. SMITH

University of Arizona, Tucson, Ariz.

FLUORINE ingestion as the cause of mottled enamel which is endemic in many parts of this country and the rest of the world has been well established.[1, 2, 3]

The observation made by Black [4] in 1916 that mottled teeth appeared to have less caries than so-called normal teeth, has recently received much attention. Dean, *et al.*,[5] have reported that the incidence of caries was appreciably less in the mottled teeth of the 12, 13, and 14 year old children in Galesburg and Monmouth, Ill., schools than in the same age group of the nearby communities of Macomb and Quincy, where mottled enamel was not endemic. Dean and his coworkers, although apparently convinced that the higher fluorine content of the waters of the former cities accounted for the lower incidence of dental caries, were somewhat hesitant to conclude that the fluorine content of the water was the only factor involved because of other differences in the mineral composition of the water supplies, primarily in the amount of calcium and magnesium.

Miller reported experiments with rats in which caries development was inhibited by the inclusion of 250 p.p.m. of sodium fluoride in the caries producing ration. Cox [6] has more recently produced mottled enamel in rat molars, and reports that such teeth are more resistant to caries produced by a corn meal ration, than were the molars formed without the addition of sodium fluoride to the ration. Cox [6] makes rather sweeping conclusions and very broad recommendations for the application of his findings made on rats to the dental ills of the human race. He goes so far as to state that addition of fluorides to community water supplies provides an "attractive means of mass reduction of dental caries; that prophylactic measures through other media such as bottled water, milk supply, and fluorine containing medicinals are feasible; and that means of control of fluorine in the whole dietary of children should be undertaken."

To one who is familiar with the disfiguring dental defect known as mottled enamel which affects the teeth of every person who drinks water containing as little as 1 p.p.m. of fluorine during the years of tooth formation, this recommendation seems, to put it mildly, unsafe. There is ample evidence that mottled teeth, though they be somewhat more resistant to the onset of decay, are structurally weak, and that unfortunately when decay does set in, the result is often disastrous. The chart graphically presents the result of a survey of the situation in St. David, Ariz., a community where water supplies range from 1.6 to 4.0 p.p.m. of fluorine. This survey included the

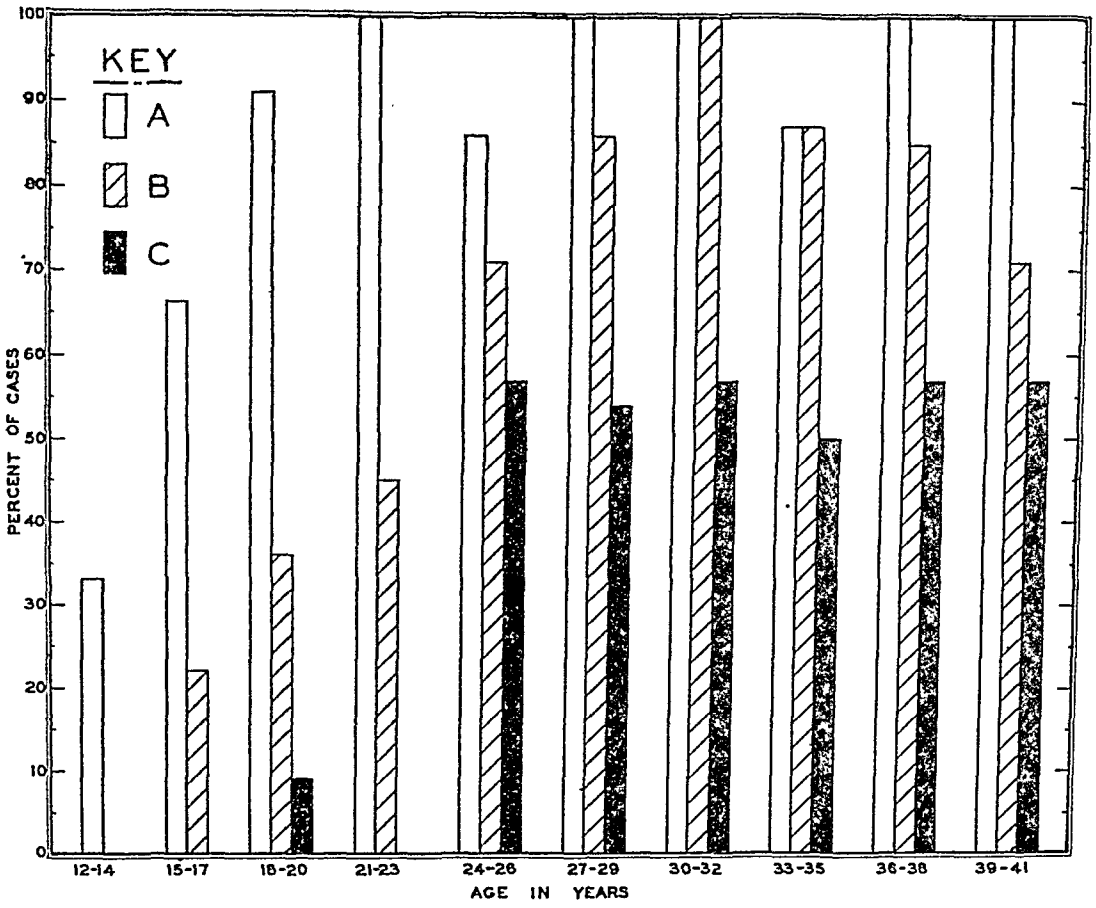


CHART 1—DENTAL SURVEY OF THE MOTTLED TEETH OF THE INHABITANTS OF ST. DAVID, ARIZONA

A. Per cent of age group in which caries was observed

B. Per cent of age group in which some teeth had decayed and been extracted after unsuccessful attempts to repair them

C. Per cent of age group in which all teeth had been extracted and replaced by false teeth

adult group so that a truer picture of the durability of mottled teeth could be obtained.

It may be seen that although only 33 per cent of the children in the age group from 12 to 14 years showed any carious lesions, the percentage of persons with carious teeth increased with age as was to be expected. Beyond the age of 21 years, there were relatively few individuals in which caries had not developed. That the result of the onset of caries was especially severe is reflected in the high percentage of all age groups with extracted teeth. Caries once started evidently spreads rapidly. Steps taken to repair the cavities in many cases were unsuccessful, the tooth breaking away when attempts were made to anchor the fillings, so that extraction was the only course. That decay was widespread and repair was highly unsuccessful among the young adults is shown by an incidence of more than 50 per cent of false teeth in the age group 24 to 26 years. This high incidence of false teeth appeared in all subsequent age groups. Very rarely, adults were found whose teeth, though mottled, were free from caries. It was the exception rather than the rule to find dentitions from which there had been no extractions because of inability to repair carious teeth successfully.

It would appear therefore, that even though fluorine ingestion during the

period of tooth formation may produce teeth which offer more resistance to bacterial invasion, the disadvantage of the resulting poorly constructed, internally weak, mottled teeth may far more than offset the advantage of a greater resistance to external invasion by bacteria.

A word of warning is thus offered to any plan to build caries resistance into teeth by addition of fluorides to public water supplies as a public health procedure so attractively suggested by Cox, *et al.* The range between toxic and non-toxic levels of fluorine ingestion is very small. Any procedure for increasing fluorine consumption to the so-called upper limit of non-toxicity would be hazardous. This would be especially true in the case of addition of fluorine to public food or water supplies where uncontrollable individual fluctuations in intake would be encountered.

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Personnel Administration Under Civil Service*

GEORGE T. PALMER, DR.P.H., F.A.P.H.A.

Deputy Commissioner, Department of Health, New York, N. Y.

THERE is a definite trend toward the extension of the civil service system in government. The New York City Department of Health is under civil service and the management of civil service is in the hands of a very capable commission. It is believed that the varied experiences of the Health Department in meeting its personnel problems under civil service jurisdiction may be of value to communities not at present so covered.

CIVIL SERVICE PROCEDURE

New York City has had a civil service system for many years. In 1934, 91 per cent of the 2,500 employees of the Health Department had civil service status. There were 10 exempt positions at the top and 221 non-competitive positions which could be filled by the Commissioner without restriction. Civil service has since been extended to cover the entire department of 2,900 employees, with the exception of 5 exempt positions.

The civil service procedure in New York City covers not only the method of appointment and discharge, but also establishes titles of personnel and salary grades and governs promotions.

In order to establish a new position in the department, the first step is to have the title approved by the Civil Service Commission and the position accepted in the budget. When this is done, the Civil Service Commission holds an examination to obtain a certified list of qualified candidates. This may take several months or the better part of a year in some instances. In the meantime, the department may secure permission from the Budget Director to make a temporary appointment. When the certified list of eligibles is completed, the temporary appointee must be dropped and the top person on the list appointed. There is a 6 months' probation period for a new employee, during which he can be dropped if his work is not satisfactory.

In the last 6 years there have been appointed 6 most competent bureau directors, all through civil service examination. In one instance, however, due to lack of complete satisfaction with an existing eligible list and to litigation and budget difficulties, one bureau has not yet obtained a full-fledged civil service director.

During the same period there have been 35 people discharged from the department. Charges were preferred, hearings were held before the Commissioner, and the action was taken.

* Read before the Health Officers Section of the American Public Health Association at the Sixty-eighth Annual Meeting in Pittsburgh, Pa., October 17, 1939.

In only one instance was the Commissioner's action reversed in the courts.

DROPPING OF NON-COMPETITIVE PERSONNEL

In the spring of 1934 it was necessary for the city to make drastic cuts in expense. Over a half million dollars was lopped off the Health Department budget. Personnel had to be dropped, positions eliminated. There were a number of people in non-competitive positions, that is, not possessing civil service tenure. They had been appointed over a period of many years. These appointments were not always just what the director of the bureau desired. Necessarily some of the work was of pretty poor calibre. Some of the workers led a rather independent existence. They set their own pace. They apparently had no fear of disciplinary action and seemed to feel a certain security in their positions.

When under the present administration the budget had to be curtailed, there was opportunity to pick and choose among these non-competitive employees. The best ones, the ones who had a good working record, regardless of the fact of their appointment in previous administrations, were retained. The others were dropped. This weeding-out process was a great boon to the bureau. It solved at once some of the problems that had tormented the director for some time.

DROPPING CIVIL SERVICE PERSONNEL

In dropping those in civil service positions, however, there was no chance to pick and choose. Employees had to be dropped in the inverse order of their appointment. The last one appointed was the first to be dropped. This was an unsatisfactory experience because good workers had to go if they were the most recent appointees. If only it had been possible to reach out and drop some of the less efficient workers longer in the department, it would have been beneficial to the service, but civil service regulations did not permit this. In this instance civil service was a handicap to better service.

As vacancies occurred later, the civil service people who had been dropped but who were placed on a preferential list, were eligible again for reappointment. They had to be reappointed in the order of the date of their original appointment. Repeatedly friends of one person well down on the list urged her prompt reappointment. The person in question had no unusual abilities. No explanation could convince them that it was impossible to reappoint their friend until her name was reached on the list, even if there had been a willingness to do so. Incidentally, the individual and her backers were sympathetic to the new city administration. They could not understand why the department could not stretch a point and restore the person promptly in advance of those ahead of her on the list. In this instance, civil service prevented special privilege or personal connections, even if there were a desire to exercise them, from operating unfairly to those on the eligible list.

At the time of this extensive budget reduction a complicated civil service tangle also was encountered. There were a number of varieties of inspectors in the department—sanitary inspectors, industrial sanitary inspectors, and food inspectors. Some of the food inspectors were appointed from a food inspectors' eligible list, some from a city milk inspectors' eligible list, and some from a country milk inspectors' eligible list. Fortunately there were no eligible lists for cabbage inspectors or cheese inspectors. That would have made it still more complicated. Food inspectors were dropped in the inverse order of their appointment to the department regardless of their order on the special-

ized civil service lists. There were protests, and the Civil Service Commission ordered this to be corrected by dropping people according to their standing on the specialized eligible lists. In other words, a country milk inspector longer in the service of the department had to be dropped ahead of a food inspector because the country milk inspectors' list was promulgated after the food inspectors' list. In this instance, civil service regulations, or at least their interpretation, caused considerable complications and ill feeling within the department.

CIVIL SERVICE TITLES

One person long in the service, and most dependable, had the title of "laboratory helper," a somewhat nonspecific title. He drove an automobile and collected cultures from Health Department stations and brought them to the laboratory. Was he working within his title? After this employee had been doing this work for many years, the Civil Service Commission suddenly decided that this was not the work of a laboratory helper. He would either have to be dropped or withdrawn from his present duties and placed within the laboratory, washing glassware and other similar work. In this instance, a man well fitted for the job was judged to be ill-fitted to his civil service title.

PROMOTION EXAMINATIONS

A promotion examination for supervising nurse was held. Nurses of various years' experience in the department took the examination. Some nurses whose career in the department had not been too satisfactory made the supervisors' list, and had to be appointed supervisor when their turn came. Other nurses whose work and ability were of an outstanding nature, failed the examination. In this instance, the judgment of nursing supervisors who had worked long with the nurses, who knew their characteristics and abilities from actual experience, had to be cast aside in favor of a selection by written examination. In one sense this has seemed illogical and not in the best interests of the department.

An excellent stenographer in the department became more and more valuable as an administrative assistant. In consequence, the taking of dictation was assigned to others. This stenographer took a promotion examination to the next grade and failed because through lack of practice she could not take rapid dictation, this being a heavily weighted factor in the promotion examination.

A very proficient clerk stood part way down on a promotion list to the next grade. His responsibilities and performance were such as to entitle him to be raised in salary and promoted to the next grade. It was impossible, however, to raise his salary to the next grade until all on the list above him had had salary increases to the next grade level. The budget adjustments necessary to move all people up to the next grade added up to such a substantial sum as to prevent the individual in question from being advanced. In fact, he had to wait until salary increases for some less proficient and with lesser responsibilities were provided.

For certain titles, such as clerk, there are city-wide promotion examinations as well as department promotion examinations. In one city-wide examination Health Department clerks stood high on the list. When a vacancy for the higher grade occurred in another department, the Health Department clerks accepted the new position at a higher salary. The Health Department once lost 40 clerks in a mass exodus. The department lost the benefit of several years' experience of all these clerks and had to undergo all the attendant inconvenience in breaking in new clerks.

To fill these vacancies it was necessary to interview 400 clerks to secure 40 who would accept appointment. The others did not want a position in the Health Department because a rumor was abroad that advancement here was too slow.

In some of these implied criticisms of civil service, it should be said in all fairness that part of the difficulty was due to inability to secure budget changes.

ADVANTAGES OF ADMINISTRATION WITHOUT CIVIL SERVICE

Let us discuss this subject in its broader aspects. First, what would be the advantages of a free choice system of appointments, that is, without the restrictions of civil service?

The executive unhampered by civil service restrictions possesses this advantage. In deciding on appointments he has the opportunity of consulting competent individuals whom he personally knows and trusts. A recommendation from someone who has worked with a person, who has seen him perform, seen him under varying conditions of stress, who has seen how he "weathers" among his colleagues and with his subordinates, means a great deal in determining capability, probably more than a written or oral examination by examiners who do not have this knowledge.

Civil service, it is true, substitutes "what you know" for "whom you know." It is not altogether successful, however, in determining "how you do." It is a more difficult task to judge through available examination technics that intangible something called "administrative ability."

Some individuals stand up under the grind of an examination better than others. A qualified person with proven abilities, with commendable personal traits, may be surpassed in a written examination by one less able, though well informed and having a good memory. There is an outstanding instance in the New York City Health Department of a most competent person who after numerous promotion examinations has failed repeatedly because of examination jitters. Well merited salary increase could not be given because of failure to pass a promotion examination to the next higher grade. And yet there is not the slightest question about the individual's ability to do excellently the job assigned.

A free hand in managing a department gives a freer opportunity to weed out inefficient employees. Civil service or security in office affects some people adversely. In some it weakens ambition. This manifests itself in laziness or in an autocratic, overbearing attitude. The person does not keep up to date. He does the work assigned mechanically, but that is all. There is no interest. Initiative and originality have gone. He resigns himself to the inevitable; becomes sour and cynical. This attitude not only lessens his usefulness but brings disrepute on civil service employees in the eyes of the public and causes discontent among fellow employees.

An executive's position is made difficult. He may be fully aware of these circumstances. And yet it is hard to discharge an employee for loss of initiative or lack of interest. How can one present specific evidence of the time and place of loss of initiative? And yet to get rid of such an employee, charges must be specific.

A department under civil service then is inclined to go slow in weeding out the known, partially efficient personnel. This means that over the years a department may suffer from the accumulation of inefficient employees.

Of course, the question may be raised, is this the fault of civil service or is it due to over-cautiousness on the part of a department? Civil service

rules provide for an orderly means of dismissal. If a department believes that inefficiency exists, then it should secure the supporting evidence and proceed.

ADVANTAGES OF CIVIL SERVICE

Now let us look at the other side of the question.

The main advantage of civil service is that it relieves the Commissioner from all sorts of pressure and dictation as to appointments. With a sincere and capable Civil Service Commission—and the present Commission in New York City is of that calibre—qualified applicants are supplied to the department. The political leader is shorn of his power to dictate or even recommend. Not even the Mayor, if he were so inclined, can dictate what individual is to be appointed, and it is not only against the politician or the governmental superior that the Commissioner is protected. He is protected also against non-political, professional groups and individuals who with quite honest motives are manoeuvered into the backing of a particular and not necessarily incompetent candidate. Such groups and such individuals are capable of harboring grudges and initiating reprisals, as well as the out-and-out politician. Under civil service, however, the Commissioner cannot be blamed for not appointing a particular individual when he has no authority to do so.

Even under the free choice method, mistaken judgments and dissatisfactions have been known to occur. Sometimes the best and most trusted recommendations which fit a person in one environment do not hold good in another environment and in another type of position.

Then again, is the restriction under civil service any more stringent than under the free choice system? Is the free choice always as free as it is cracked up to be? Are there not claims of a political or social nature that force the hands of an executive just as much, if not more, than civil service regulations?

And, finally, the free choice system cannot always be assured of the best of intentions or the most ethical auspices under changing administrations. Are there not far more glaring instances of the appointment of incompetents under the free choice system than under civil service? There is nothing more demoralizing or debasing to a staff than to see an incompetent placed in a position of responsibility at a high salary through personal or political connections. In government is it not better in the long run to provide an appointment system that holds steady in fair weather and foul? The impersonal selection, in spite of some drawbacks, is better designed for the long pull.

Instances given above suggest that civil service in some instances tends to retard the advancement of competent people. Without civil service, however, there is opportunity to err on the other side by advancing certain favored people out of proportion to their abilities.

Under civil service the Commissioner is protected against dictation as to the discharge of a particular employee. He is free to discipline when it is deserved. Of course, his action cannot be capricious. There must be good ground for discharge and the Civil Service Commission and the courts are the watchdogs against discharge for unjustified cause. Civil service may cause an executive more effort in getting rid of inefficient employees, and yet, are the inefficient weeded out more promptly or more thoroughly under a free choice system? The opportunity to clean house exists, but is advantage taken of this opportunity? Are there not ties to influential friends of employees that make it just as difficult to discharge

people as the legal restrictions of civil service? Civil service must not be condemned unduly without knowing whether the dropping process is used more intelligently under one system than another.

As for the sagging of employee interest under the security of civil service, there is a remedy for this and that is a continuing program of staff education. This can be designed so as to rekindle the spark of dormant or dying interest and reëstablish a new and higher level of interest. This has been tried in the New York City Health Department and has been found effective. In most instances the light never burns so low but what it can be made to brighten under the proper stimulus. Long delayed salary recognition, where merited, is also essential as a restorative process.

Civil service protects the employee in his position against wholesale dismissals purely for political reasons at times of change in municipal administration. This means peace of mind and better morale within the staff, and likewise saves disruption of service.

In all this discussion civil service is being conceived as a bona fide institution as it was intended. In the hands of the unscrupulous, of course, irregularities are possible and the principal aims can be defeated. The public must be insistent that a high type of personnel be in charge and that all possible safeguards be provided to protect it against exploitation. Civil service in name only does not mean anything. It must be non-political and impartial in its actions.

SUMMARY

From the point of view of the New York City Health Department the advantages of civil service far outweigh the disadvantages. Qualified employees are being recruited for the department. The Civil Service Commission is alive to the shortcomings and is constantly striving to correct them. The Commission is anxious to provide good employees to all city departments. Examination methods are being steadily improved, and the product of the examinations is notably better each year.

So long as the health department is provided with a few exempt positions at the top to permit a commissioner to have at his side persons loyal to him and sympathetic with his policies, it is most advantageous to have the balance of the department under civil service. To counteract the tendency of employees letting down while basking in the security of their positions, a continuing program of staff education is necessary. The time has come when staff education must be recognized to be just as essential to good service as many bureau activities. Bureau directors should be held accountable for such service as a part of their administrative duties.

Civil service is a very democratic institution. Its principles fit in with our general governmental structure. Health department administration will be strengthened by its extension.

Coliform Bacteria and Streptococci in Swimming Pool Water*

RALPH L. FRANCE AND JAMES E. FULLER, PH.D.

Massachusetts Agricultural Experiment Station, Amherst, Mass.

CALVERT,[1] in a brief review of the streptococcus test for water pollution, concludes: "There remains much work to do in respect to method of procedure as well as evaluation of results."

Recently the writers have had the opportunity to compare the streptococcus test with the coliform test in a college swimming pool. It is the object of this paper to report the results of that study.

The streptococcus test as first applied to water pollution was designed to show the presence of fecal streptococci. This is particularly true of the test as used in England. The test has not been recommended in this country as a standard procedure. The coliform test is accepted as a more accurate measure of intestinal pollution. When the streptococcus test was first applied to bathing places many investigators assumed that the organisms found were of intestinal origin. Some technicians and sanitarians still assume that. However, the studies made by Mallmann [2-7] certainly would seem to indicate that this is not true. In one of his studies, Mallmann [6] found that the streptococcus index in bathing places fluctuated with the bathing load, while this was not always true in the case of the coliform index. Mallmann felt then that the streptococcus index was a better measure of the pollution introduced by the bathers than the coliform index.

Calvert,[1] commenting on Mallmann's results showing that the coliform index in a chlorinated pool may be acceptable and yet streptococci be present, adds parenthetically: "This is at variance with a small amount of unpublished experimental work done on a chlorinated public supply where no streptococci were isolated from 50 ml. portions of water after passing the final point of chlorination."

The results given below will show that in the pool under test it was the exception rather than the rule to find coliform bacteria present, whereas streptococci were always present when bathers were in the pool.

METHODS

The pool used in this survey is of the recirculating type with a capacity of 110,000 gallons. Liquid chlorine is used as the germicidal agent, and the residual chlorine is kept at between 0.3 and 0.6 p.p.m. when the pool is in use. The manager of the pool holds a college degree in engineering so that the pool receives better than average care. Each bather is required to take a thorough bath, using plenty of soap, before entering the pool. At no time during this study was the pool overloaded with bathers.

The methods of procedure for demonstrating the presence of coliform

* Contribution No. 342.

bacteria and streptococci were those recommended in *Standard Methods of Water Analysis* (8th ed., 1936).

Samples were collected on at least 3 days of each week during the period of survey. The samples were collected according to the following daily schedule:

Sampling Period No.	*Time*	*Condition of Pool*
1	9:45 A.M.	Pool closed since 6:00 P.M. of previous evening.
2	10:20 A.M.	Pool open since 10:00 A.M.
3	11:30 A.M.	Pool in use since 10:00 A.M.
4	1:45 P.M.	Pool closed since 11:45 A.M.
5	2:20 P.M.	Pool open since 2:00 P.M.
6	3:30 P.M.	Pool open since 2:00 P.M.

Throughout the remainder of this report sampling periods will be referred to by the numbers given in the above schedule. Duplicate, and sometimes triplicate, samples were collected at each sampling period. One was taken from the deep end, one from the shallow end, and when a third sample was collected it was taken from the side and opposite the approximate center of the pool. Determinations for residual chlorine were made daily at each sampling period. At least once each day pH determinations were made. All sampling bottles contained sodium thiosulphate, and the elapsed time between the collection of the sample and its inoculation into the presumptive medium never exceeded 20 minutes. Five tubes of presumptive medium were inoculated with each sample of water.

RESULTS

Table 1 summarizes the results obtained in this study. In the case of the duplicate and triplicate samples, taken at each daily sampling period, the results were averaged and these figures considered as representing one sample. There are several interesting observations to be made from this table. The coliform bacteria were conspicuous by their absence, since positive presumptive tests were obtained from only three samples. Out of a total of 100 10 cc. inoculations (225 if the duplicate samples were considered separately), only 12 tubes were confirmed for the presence of coliform bacteria. On each occasion this occurred when the bathing load was heaviest, that is, the No. 6 sampling period.

Table 2 gives the results of a specific day when coliform organisms appeared. The bathing load was heavier than the average. In this table the duplicate samples have been considered separately, so that 10 tubes were inoculated from each portion of water. On this day, 3 of the 10 cc. portions showed the presence of coliform bacteria. In this case, as in the other 2 cases where coliform organisms appeared, they were present in only 1 of the 2 samples collected from the pool at that particular sampling period. At no time during this survey did these bacteria appear in

TABLE 1

Summary of Results

Sampling Period Number	*Total Number of Samples*	*Average Chlorine Residual p.p.m.*	*Average Number of Bathers*	*Total Number of Positive Lactose Broth Tubes*							
				Coliform Group				*Streptococci*			
				10 cc.	*1 cc.*	*0.1 cc.*	*0.01 cc.*	*10 cc.*	*1 cc.*	*0.1 cc.*	*0.01 cc.*
1	20	0.2	0	0	0	0	0	0	0	0	0
2	20	0.35	6	0	0	0	0	80	10	0	0
3	20	0.46	12	0	0	0	0	100	70	15	0
4	20	0.48	0	0	0	0	0	12	0	0	0
5	20	0.50	15	0	0	0	0	100	85	30	7
6	20	0.43	23	12	0	0	0	100	97	75	33

TABLE 2

Results Obtained on a Day When the Bathing Load Was Heavy

Sampling Period Number	Number of Bathers	Residual Chlorine p.p.m.	Number of Tubes Positive							
			Coliform Group				Streptococci			
			10 cc.	1 cc.	0.1 cc.	0.01 cc.	10 cc.	1 cc.	0.1 cc.	0.01 cc.
1	0	0.2	0	0	0	0	0	0	0	0
2	8	0.3	0	0	0	0	9	5	0	0
3	15	0.5	0	0	0	0	10	6	1	0
4	0	0.5	0	0	0	0	3	0	0	0
5	17	0.5	0	0	0	0	10	7	1	0
6	35	0.4	3	0	0	0	10	10	6	3

less than 10 cc. portions of the water. According to the standards of Mallmann [7] the coliform index of this pool would have been acceptable and the pool classified as satisfactory.

Returning to Table 1 it will be observed that streptococci were always present in the water when bathers were using the pool. At the periods of the heaviest loads the organisms were found present in as little as 0.01 cc. of water. A small number of tests made, but not included in the tables, showed that when more than 50 bathers were using the pool streptococci could be found in 0.001 cc. of the water. These results confirm Mallmann's opinion [6] that the streptococcus index closely follows the bathing load.

According to Mallmann's standards [7] for streptococci, this pool would have been classified as unsatisfactory. Thus, we have the pool being classified as satisfactory by its coliform index and unsatisfactory by its streptococcus index. Which of these indices are we to accept?

To the writers the most interesting observations to be made from these results are the relatively high streptococcus index in proportion to the small numbers of bathers, and the rapidity with which these organisms appear after bathers have entered the pool. Table 3 shows the results obtained on a day when the bathing load was much lighter than the average. It will be noted that samples collected at the No. 2 sampling period showed the presence of streptococci in 7 of the 10 cc. portions and 1 of the 1 cc. portions. Yet there were only 5 bathers using the pool at the time, and the residual chlorine was 0.3 p.p.m. Also, these bathers were the first to enter the pool after it had stood overnight, and no streptococci had been found in 5 50 cc. portions of the water taken just before the opening of the pool. This seems a rather high streptococcus index in proportion to the number of bathers. It further indicates that these organisms must have come from a heavily contaminated source. Inasmuch as the streptococci were not present in large quantities of the water after the pool had stood overnight, we must eliminate the possibility of poor filtration or of chlorine-resistant strains. Since the appearance of the organisms follows so closely the entrance of the bathers into the pool it seems fair to assume that the bathers were introducing the bacteria. The samples of the No. 2 sampling period were taken within 10 to 15 minutes after the bathers had entered the pool. On some days as few as 3 bathers were in the pool when these samples were collected. Yet it was possible to find streptococci in 1 or more of the 10 cc. quantities examined. As to the streptococci being from intestinal sources, that can be eliminated because it would not be possible to have so many fecal streptococci present without finding some coliform bacteria. The writers are making a pure culture study of these organisms, and the results obtained at this writing indicate that they are not fecal streptococci.

TABLE 3

Results Obtained on a Day When the Bathing Load Was Light

Sampling Period Number	Number of Bathers	Residual Chlorine p.p.m.	Number of Tubes Positive: Coliform Group 10 cc.	Coliform Group 1 cc.	Coliform Group 0.1 cc.	Coliform Group 0.01 cc.	Streptococci 10 cc.	Streptococci 1 cc.	Streptococci 0.1 cc.	Streptococci 0.01 cc.
1	0	0.2	0	0	0	0	0	0	0	0
2	5	0.3	0	0	0	0	7	1	0	0
3	8	0.5	0	0	0	0	9	4	0	0
4	0	0.6	0	0	0	0	2	0	0	0
5	10	0.55	0	0	0	0	10	6	1	0
6	18	0.5	0	0	0	0	10	9	3	0

Mallmann [8] in a personal communication states: "These organisms are not *Streptococcus fecalis* as they emanate from the mouth rather than from the intestine. We have carried on a series of experiments which have not been published as yet, definitely proving the source of these organisms." It is common knowledge that there occurs considerable flushing out of the nasal cavities and the mouth in swimming and diving. Also, many bathers add to this by gargling and expectorating.

In experiments now being conducted by the writers there is evidence to indicate that these organisms are also found on the body surface of the bathers before they enter the pool. This evidence will be published at a later date.

If these organisms are of oral origin then they must be given some sanitary consideration. If they are body surface saprophytes then it does not seem that they are of much sanitary significance.

From the results of this study it was found that these organisms are quite resistant to chlorine. Mallmann [4] has found that the streptococci in swimming pools are more resistant to chlorine than are the coliform bacteria. An attempt was made during the course of this survey to reduce the numbers of streptococci to a minimum, if not to eliminate them. When the residual chlorine content was raised to 0.6 p.p.m. their numbers were not materially decreased. When the residual chlorine was raised to 0.7 p.p.m. there was a noticeable reduction in their numbers, but there was also a noticeable reduction in the number of bathers. Numerous complaints were received of mucous membrane irritation, so that it was impossible to carry the experiment further at that time.

The writers expect in the course of experiments now under way to confirm the results of Mallmann that the source of these streptococci is the mouths of the bathers. It is possible that the organisms come from both the oral cavity and the body surface. Certain results obtained to date in a pure culture study of these streptococci indicate that they may not be true streptococci but micrococci which assume chain formation under certain biochemical conditions.

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Vapors and Their Routine Measurement*

PHILIP DRINKER

Professor of Industrial Hygiene, Harvard School of Public Health, Boston, Mass.

IN order that there may be no confusion between the subject of my paper and that of Mr. Patty on Gases,† I have assumed that "vapors" includes those substances existing in both the gaseous and liquid phase at ordinary atmospheric conditions. There will be some common substances, like HCl, which conceivably belong in either class. Thus, we find the solubility of HCl gas in water given in chemical handbooks; we buy the acid as an aqueous solution; yet it is a true gas. Similarly, H_2S is a gas, yet most accidents from H_2S result from its evolution from liquids in which it is dissolved. Under such conditions, the H_2S tension in the liquid is all important and we would surely then consider it as a vapor present in both the gaseous and liquid phases.

The most important hygienic risk from any poisonous substance is that which results from repeated exposures. Acute poisoning, as from CO, may be fatal, but it is accidental; it takes place at a definite time and place and rarely has a cumulative aspect. In industry, a catastrophe like benzol poisoning is caused by repeated exposures to concentrations of benzol in the air breathed. Such concentrations may not be in the least objectionable to the worker. This makes them all the harder to control, for both management and labor are very apt to belittle the danger or even to deny its existence until some unpleasant event like a fatal poisoning or an expensive damage suit awakens everyone.

The fundamental methods and principles by which the most important gases met in industrial hygiene practice can be determined have been reviewed by Mr. Patty. These methods all involve the taking of a comparatively small sample at a definite time and place, and from it determining the amount of the impurity in a certain air volume. Presumably, such samples are taken in order to get an idea of the fitness of the environment for the worker. A health risk, a reprimand by local or state health authority, or a damage suit, is in the mind of whoever orders the taking of the sample. Sometimes there is a fire risk from the contaminant, and once in a while valuable material is being lost. It is quite possible, then, that for routine sampling (not for sampling by the occasional investigator or inspector) we may accomplish our objectives better by installing equipment which will take continuous samples and record the results than by small grab samples taken every so often. It is this aspect which I propose to discuss.

THERMAL METHODS

Perhaps the best known gas recorder of hygienic interest is that for CO.[1]

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† October *Journal*.

It depends upon the oxidation of CO to CO_2, a reaction which liberates enough heat to be measured by means of thermopyles and recorded on a recording potentiometer. The sensitivity of such a device depends upon the oxidizing catalyst and upon any interfering substances which may accompany the gas.

It is not necessary that the reaction or oxidation be complete, providing it takes place at a constant rate and always in the same fashion. That is, 10 parts per 10,000 of CO must always give off the same amount of heat, and the fact that only incomplete conversion of CO to CO_2 is secured is no drawback to the usefulness of the apparatus.

In the operation of the modern vehicular tunnel these recorders are just as essential as the ventilating fans. Their response to a heavy load on the ventilating equipment is rapid and reliable, but the results are purely empirical, so that the instruments must be calibrated from time to time against measured mixtures of air and CO.

Any gas or vapor which can be oxidized easily and uniformly can be adapted to recording in somewhat similar fashion. The explosion meters for gasoline vapors and for gases, such as methane, utilize this principle. If the presence of a flammable mixture of gasoline vapor and air can be indicated by the ringing of a bell or the setting off of a howler, it is a simple matter to make the indicator over into a recorder.

On paper these plans look easier than they prove to be in practice, for the final apparatus is apt to be cumbersome and complicated. The explosion meters and CO indicators now on the market are portable, which is a very desirable feature, but the recorders are bulky and must be set up with an eye to permanence.

The lower limit of vapor or gas concentration which can be recorded depends, of course, upon the magnitude of the heat of combustion of the substance in question. Thus, the modern CO recorder is not of much use below 1 part per 10,000. But the heat of combustion of CS_2 to SO_2 and CO_2 is about 5 times that of CO to CO_2, so that, volume for volume, it should be possible to record CS_2 by a thermal method in concentrations one-fifth of those for CO, or about 20 p.p.m. Unfortunately, this is not low enough for hygienic purposes, so that it is unlikely that CS_2 recorders based upon these ideas will be developed. What the lower limits would be for the recording of any gas or vapor by this thermal method depends upon the physicochemical properties of the mixture.

VAPOR-TENSION METHODS

There have appeared recently [2] new condensation methods adapted to determination of substances which are non-miscible with water and which have appreciable vapor tensions under ordinary conditions. Burrell and Jones [3] were the first to make use of this idea, but their equipment was designed to determine concentrations of vapors, like gasoline, which offered a fire risk—they dealt, therefore, with concentrations measured in per cent, and not in parts per million. It is doubtful if it would be practicable to adapt any of these methods to continuous or even to intermittent recording, so I shall not discuss them further.

COLORIMETRIC METHODS

Automatic color analyzing has been a practical entity for some time in many plant problems but the principles have been little used in gas analyses. Stackhouse and Chaney [4] have developed a colorimetric recorder for low percentages of N_2O_4 and of H_2S as met in the manufactured gas industry. The gas is bubbled slowly through a suitable absorbent and the magnitude of a color

change produced by a chemical reaction is measured photoelectrically and recorded, as by a recording potentiometer.

These recorders are in actual use in gas plants and much of the set-up could undoubtedly be adapted to the determination of other gases. For both N_2O_4 and H_2S, the sensitivity is adapted to the range below 10 p.p.m. which, for these gases, makes the instruments of special interest in occupational disease problems.

The selenium sulfide mercury recorder [5] of the General Electric Company is a good example of an instrument adapted to the control of vapor concentrations by colorimetric recording. The darkening of selenium sulfide paper by mercury vapor is a very sensitive reaction and the instrument seems to have proved useful in practice.

Owens's recorder for the soot and smoke of city air is well known in Britain and in this country. A disc of filter paper is marked off in fractions of 24 hours and rotated by a clock. At intervals, the paper stops and air is then drawn through at controlled rates making a dark spot about ⅛" in diameter. A series of such spots are made for known concentrations and the unknowns are then matched against the knowns. Obviously, many chemical reactions can be adapted to utilize the Owens's apparatus and thus be recorded.

The lead acetate paper test of H_2S giving the dark PbS color is about as old as quantitative chemical analyses. A $PbAc_2$ paper recorder for H_2S in concentrations as low as 1 p.p.m. has been described by Reed,[6] while another made by Bushnell [7] is claimed to be satisfactory for use in the oil industry. Reece and Drinker [8] have developed such a recorder for use in rayon plants * where H_2S concentrations in the spinning rooms may be something of a problem. In the latter device, the color of PbAc paper before and after gas has passed through is compared photoelectrically and the differences in darkness are recorded.

In our experience, one of the chief difficulties in making an apparatus adapted to plant use was the obtaining of a paper of uniform density. Without such paper, the degree of darkening from PbS was irregular.

CONDUCTIVITY METHODS

One of the most serious pollution problems we have in this country is from SO_2 which is, of course, a true gas and not a vapor. It may, however, carry with it some SO_3 as an aqueous mist. Concentrations greater than about 1 p.p.m. affect vegetation and are, therefore, the direct concern of us all.

Sulfur dioxide is determined in small amounts by iodometric methods. It is recorded, however, by a method based on entirely different principles. The air in question is passed into acidified H_2O_2 and the SO_2 thereby oxidized by SO_3. The SO_3 is then absorbed and the change in conductivity is recorded by means of a conductivity meter. The apparatus to which I refer was developed by Thomas [9] at Salt Lake City in connection with pollution studies in the vicinity of sulfide roasters.

In estimating sulfur vapors or gases in the air of factories or mines, Thomas's meter can be adapted directly to any in which the gas can be burned to SO_2, under constant conditions. Again, in the rayon industry, we have just such a problem, for we wish to record CS_2 vapor in concentrations ranging down to less than 1 p.p.m.

It has been shown by Thomas [10] that his meter can be adapted to the measurement of CO_2. For this, he uses NaOH as the solvent. Walter [11] states that conductivity methods have been

* Of the American Viscose Corp., Wilmington, Dela.

adapted to the recording of H_2S in $Pb(OAc)_2$, SO_2 in $K_2Cr_2O_7$, NH_3 in H_2O or dilute H_2SO_4, O_2 in potassium pyrogallate, C_2H_2 and CO in ammoniacal Cu_2Cl_2, N oxides in $FeSO_4$, Cl and Br in H_2O or alkaline H_2O_2 and SCl_2 in KOH.

The benzol vapor indicators, at present available, are of dubious accuracy below about 200 p.p.m., although more is claimed for them. They depend upon measuring the heat evolved by burning the vapor. Thomas's conductivity meter is probably of sufficient sensitivity to be used for measuring the increase in CO_2 formed by the burning of very low concentrations of any hydrocarbon vapor or of a true gas, like methane. At present, benzol must be determined by purely chemical methods which, although serviceable, are not adapted to conversion into a recording apparatus.

Other hydrocarbon vapors, like those from gasoline, from various esters, such as amyl acetate, from numerous ketones and aldehydes, are met from time to time in field work, but they are apt to be ignored, as they rarely are of concern, except as fire risks. In low concentrations they are difficult to detect by any quick test, but all of them form definite amounts of CO_2 when burned and, therefore, lend themselves to the possibility of recording by the Thomas apparatus.

In like manner, it should be practicable to adapt conductivity methods to the recording of chlorinated hydrocarbon vapors, like those from CCl_4. The field method for their determination depends upon conversion of the vapor to HCl, absorption of the HCl in dilute sodium carbonate, and titration of the chloride ion. The determination and recording of either HCl or CO_2 by conductivity methods has already been accomplished and is well within the sensitivity range demanded in hygienic problems.

ABSORPTION OF RADIANT ENERGY

If light of certain wave lengths is passed through air containing a vapor, such as that of mercury, the light is filtered out in approximate proportion to the concentration of the vapor present. This fact is utilized in the photoelectric mercury detector developed also by the General Electric Company.[5]

More recently, the R. & H. Chemicals Division of Du Pont's have used this principle in the detection of trichlorethylene. Results are indicated upon a milliammeter, so that it should not be a great step to adapt the instrument to recording instead of indicating. Hansen, of Du Pont, suggests that the instrument can be adapted to the detection of vapors as shown in Table 1.

TABLE 1

Vapor	*Sensitivity p.p.m. of Air per Scale Division*
a. Mercury	0.0001 approximate
b. Perchlorethylene	0.5
c. Toluol	1.0
d. Diphenyl	1.0
e. Benzol	1.2
f. Phosgene	5.0
g. Acetone	5.0
h. Pentachlorethane	7.0
i. Trichlorethylene	10.0
j. Carbon disulfide	12.0
k. Gasoline (Blue Sunoco)	50.0

The instrument in its present form is insensitive to the following vapors in air: methylene chloride, carbon tetrachloride, ethylene dichloride, tetrachlorethane, chloroform, methyl chloride, methanol, ethanol, ethyl acetate, water vapor.

The recording of smoke density by determining the amount of visible light which is either (a) obstructed, or (b) passed through a definite distance, is fairly common practice and has been in use in power plant smoke recording for some years. Hygroscopic neuclii, as from SO_3, easily form dense fogs, the opaqueness of which to visible light can be determined photoelectrically or visually. Long[12] uses this method to detect completeness of SO_3 absorption

in the effluent gas from a contact sulfuric acid plant.

This method has been adapted by Kay [13] to the recording of CS_2 in the churn rooms of viscose-rayon plants.* Air containing CS_2 vapor is passed over heated platinum foil which oxidizes it to SO_2 and CO_2. The exit gases are then passed through a second furnace containing again platinum foil but heated to a lower temperature. In the second furnace, the SO_2 is converted to SO_3. Visible fog is then formed by passing the warm air containing SO_3 over water. The density of the fog is then measured by means of a photronic cell.

The sensitivity of this method, while fairly good, may not be enough for practical use in the rayon plants for which it was originally designed. It happens that the CS_2 control has been brought down to amounts substantially below which we had intended the apparatus originally to measure. It seems to work well, however, in the region of 10–30 p.p.m. and is sensitive to changes of about 2 p.p.m.

COMMENTS

None of these recorders is cheap. The Thomas SO_2 meter costs about $1,200, while Stackhouse's N_2O_4 and H_2S apparatus costs even more. The CO recorder sells for well over $1,500, and we fear that the equipment we have devised for CS_2 and for H_2S will cost over $1,000. There is a slight amount of servicing required for all this apparatus and check-ups against known concentrations from time to time are essential. Against these costs must be balanced the value of continuous records and the releasing of the technician who formerly took the samples. We doubt very much whether they are adapted to use by industrial hygiene laboratories of states or insurance companies. They are, however, well worth considering by firms who have a definite pollution problem, the extent of which they wish to record.

* American Viscose Corp.

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Effects of Vitamin C Intake upon the Degree of Tooth Injury Produced by Diphtheria Toxin*

C. G. KING, PH.D., R. R. MUSULIN, PH.D., AND W. F. SWANSON, M.S., D.D.S.

Department of Chemistry and the School of Dentistry, University of Pittsburgh, Pittsburgh, Pa.

THE close relationship of vitamin C intake to the development and maintenance of sound teeth in guinea pigs, monkeys, and men has been recognized for many years.[1, 2, 3] The essentially new features of the present investigation, supplementing an earlier report from our laboratory refer to: (a) the degree of tooth injury that can be caused by diphtheria toxin, and (b) the importance of a high vitamin C intake for protection against such injury.

It has been established recently in a number of laboratories that guinea pigs in "the prescorbutic state" (McCollum)—partially depleted of their vitamin C reserves—are more sensitive to injury by bacterial toxins than are well nourished animals. Analysis of the tissues after an injection of toxin shows further that the toxin causes a marked loss of the vitamin from many of the tissues within 24 to 48 hours.[4] The latter point, too, has been verified in a number of laboratories. Several authors have reported losses ranging from 30 to 50 per cent of the vitamin C (ascorbic acid) content of tissues following sublethal injections of the toxin. A few investigators have reported evidence that pointed toward a *direct* detoxifying action by neutral solutions of the vitamin, both *in vitro* and *in vivo*, but our studies have not given support for such a viewpoint. We believe that the detoxifying action of the vitamin on such complex materials as bacterial toxins *in vivo* is not due simply to a direct chemical reaction between ascorbic acid and the toxin.[5] Although a nonspecific acid denaturization of the toxin could be demonstrated readily, we could find no evidence for a specific detoxification reaction *in vitro*.

An interesting clinical report by Dr. Macy and her associates[6] during the past year showed that children receiving a marginal intake of vitamin C were especially sensitive to the development of scurvy during periods of infection. Without increasing the vitamin C intake, recovery from mild scurvy followed spontaneously after the period of infection. Additional recent papers provide evidence in support of the viewpoint that ascorbic acid is related to the processes of detoxification both in

* A summary of the present report was presented before the Food and Nutrition Section of the American Public Health Association at the Sixty-eighth Annual Meeting in Pittsburgh, Pa., October 20, 1939.

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the human body [7] and in experimental animals. In all, there is considerable evidence to indicate that the experimental work with guinea pigs reported in the present paper and in an earlier report [8] is pertinent to the problem of good tooth development in children. Recent surveys in England appear to have a close bearing on our studies, in that good nutrition and freedom from disease during infancy and childhood were the factors most closely related to freedom from dental caries [9] at the age of 10 to 14 years.

EXPERIMENTAL

Guinea pigs placed in individual raised-bottom cages when approximately 250 gm. in weight were given a standard diet [1] of rolled oats, wheat bran, yeast, butter fat, heated skimmed milk powder, and salt, supplemented by cod liver oil twice per week. Fresh spinach was fed daily until they were about 300 gm. in weight. The spinach supplement was then discontinued and pure ascorbic acid solution was given daily by pipette during the remainder of the experiment. Animals that did not show a normal growth rate were discarded. When the average weight of the animals reached approximately 350 gm., toxin injections were made intraperitoneally.

At intervals of 3, 10, and 30 days following the toxin injection * two or more animals were taken from each group for examination of the teeth, to provide an indication of the course of injury and repair.

The vitamin feeding levels were selected on the following basis: The 0.8 mg. per day intake is adequate for normal growth [10] and is slightly more than is needed for protection from external or gross symptoms of scurvy through a long interval of time. The tooth structure is not quite normal at this level, but the disturbance due to vitamin C deficiency alone is not severe. It is a sensitive zone where tooth injury due to the added factor of toxin injection can be clearly demonstrated, yet it is analogous to a state of nutrition that is apparently common in human experience. Recent papers by Boyle, Bessey, and Wolbach [11] place special emphasis upon the production of diffuse alveolar bone atrophy, both clinically and in guinea pigs, by moderate, chronic vitamin C deficiency.

The 5.0 mg. per day level is comparable to a high vitamin C intake clinically (approximately 10 times the minimum quantity that will protect against the obvious symptoms of scurvy through a period of several weeks), and might be considered analogous to a human intake of 150 to 250 mg. per day, depending upon size and age. The 5.0 mg. level is approximately 3 times higher than the level required for normal tooth development in guinea pigs when they are not subjected to infections or other unusual stresses. Such benefit as might accrue from a good state of nutrition in contrast to a marginal state of nutrition should be evident from studies with the above two levels.

DISCUSSION

The injuries to tooth structure that are related to diphtheria toxin and vitamin C, as illustrated by the accompanying photomicrographs, involve primarily the dentin and dentin forming cells, the odontoblasts. In view of the fact that the same tissues are very sensitive to vitamin C deficiency alone, and, further, that the toxin causes a marked loss of vitamin C from the body as a whole, the injury that has been observed consistently after toxin injections may be due primarily to an increased severity of vitamin deficiency. The frequency of tooth fracture on the

* When two injections were made, the first was made 3 days prior to the second, and the stated time interval was subsequent to the second injection.



FIGURE 1—Photomicrographs * of thin-ground sections, showing the lingual side of guinea pig incisors, about midway along the length of the tooth. (a) Vitamin level, 5 mg. per day for 30 days; no toxin injections. (b) Vitamin level, 5 mg. per day; toxin injection, 0.4 m.l.d.; time elapsed after injection, 30 days. (c) Vitamin level 5 mg. per day; 30 days after receiving 0.8 m.l.d. of toxin. The tooth structures are essentially normal in each case.

* The authors are indebted to Mr. Reinhardt Rosenberg for his assistance in the preparation of photomicrographs.

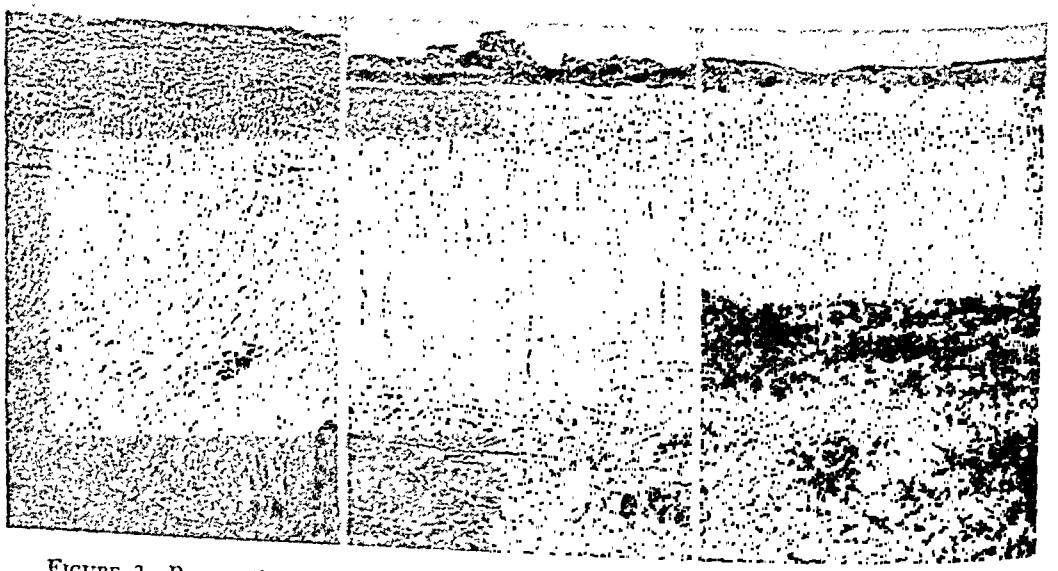


FIGURE 2—Preparation of sections and tooth areas similar to those shown in Figure 1. (a) Vitamin level, 0.8 mg. per day; 30 days after receiving 0.4 m.l.d. of toxin. (b) Vitamin level, 0.8 mg. per day for 30 days; no toxin. (c) No vitamin C supplied during a 20 day test period; no toxin (uncomplicated severe scurvy).

low nutritional level subsequent to toxin injections, together with the histological record of increased injury to the odontoblasts and dentin, affords evidence of the benefit to be derived from a vitamin C intake that is above the minimum requirement for normal growth and superficially apparent health.

SUMMARY

Guinea pigs receiving 5.0 mg. of ascorbic acid per day did not show

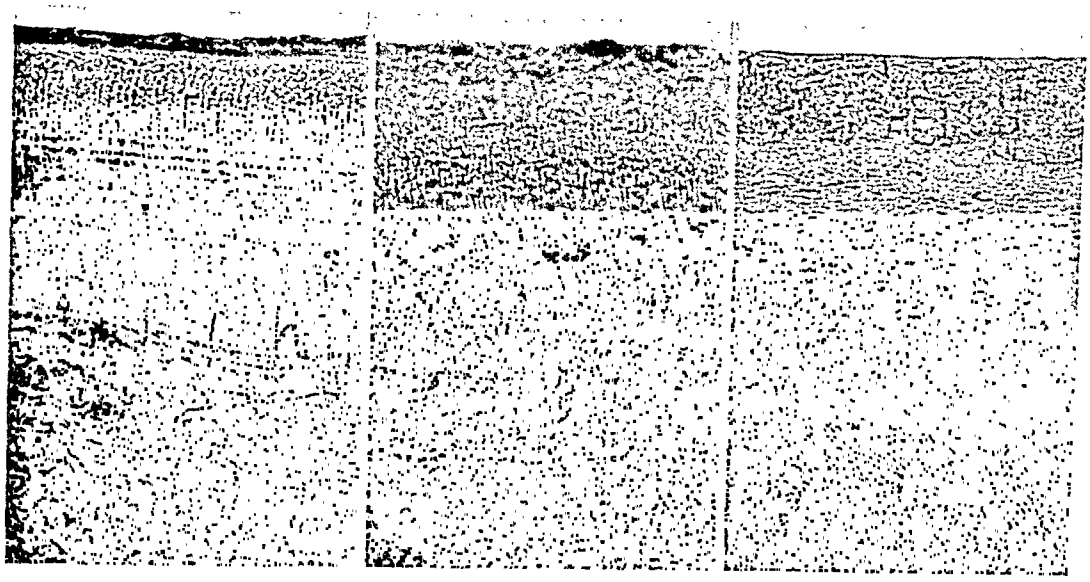


FIGURE 3—Preparation of sections and tooth areas similar to those shown in Figure 1. (a) Vitamin level, 0.5 mg. per day for 10 days; no toxin (mild uncomplicated vitamin C deficiency). (b) Vitamin level, 0.8 mg. per day; 10 days after receiving 0.8 m.l.d. of diphtheria toxin. (c) Vitamin level 0.8 mg. per day, 10 days after receiving 0.4 m.l.d. of toxin.

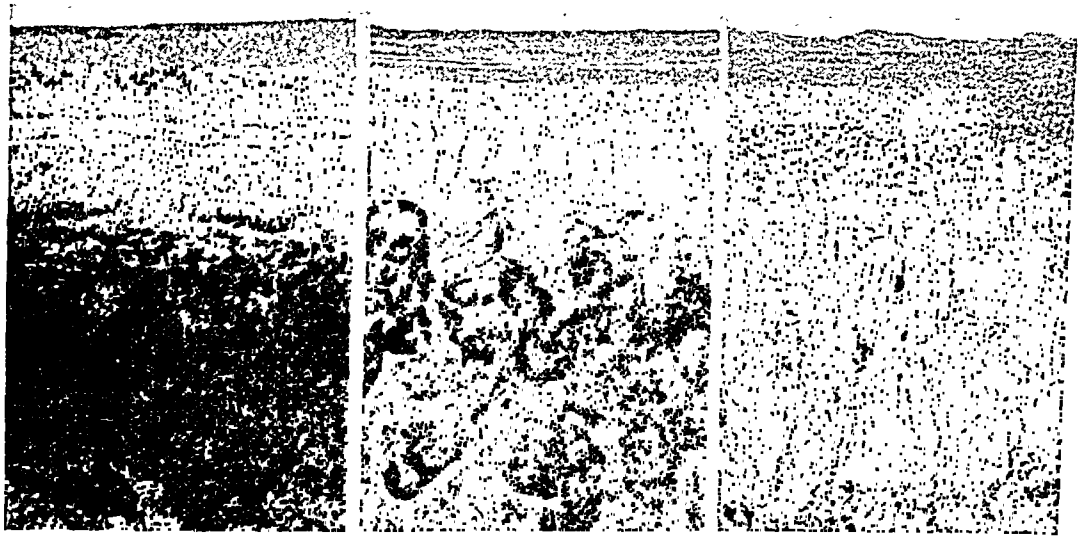


FIGURE 4—Preparation of sections and tooth areas similar to those shown in Figure 1, except that (a) and (b) represent areas nearer the root tip where there has been less opportunity for the development of dentin. (a) Vitamin level 0.8 mg. per day; 3 days after receiving 0.8 m.l.d. of toxin, showing distinct injury to the pulp and odontoblasts. (b) Vitamin level 0.8 mg. per day; 3 days after receiving 0.4 m.l.d. of toxin. Severe injury to the odontoblasts and pulp is evident. (c) Vitamin level 0.8 mg. per day; 30 days after receiving 0.8 m.l.d. of toxin. Marked injury followed by very incomplete recovery or repair.

gross or histological evidence of injury to the teeth when diphtheria toxin was injected intraperitoneally in dosages of 0.4 or 0.8 m.l.d. Comparable animals that received 0.8 mg. per day of ascorbic acid without toxin injections grew at a normal rate and showed only slight histological evidence of vitamin C deficiency during the experimental period. Injections of 0.4 or 0.8 m.l.d. of diphtheria toxin resulted in marked injury to the odontoblasts and dentin in the

TABLE 1

General Plan of Experiment, Illustrating the Relation of Vitamin C Intake to the Degree of Tooth Injury Caused by Diphtheria Toxin in Guinea Pigs

Group	Vitamin Intake per Day [1] mg.	Toxin Dosage [2] m.l.d.	Time Elapsed After Treatment Days	Condition of Teeth
1	5.0	0	30	Normal
2	5.0	0.4	3	"
3	5.0	0.4	10	"
4	5.0	0.4	30	"
5	5.0	0.8	3	"
6	5.0	0.8	10	"
7	5.0	0.8	30	"
8	0.8	0	30	Evidence of chronic deficiency in odontoblasts and dentin
9	0.8	0.4	3	Distinct evidence of injury to the odontoblasts and dentin
10	0.8	0.4	10	" " " " " "
11	0.8	0.4	30	" " " " " "
12	0.8	0.8	3	Severe injury to the odontoblasts and dentin, some injury in pulp
13	0.8	0.8	10	" " " " "
14	0.8	0.8	30	" " " " "
15	0	0	10	Typical moderate changes in the odontoblasts and dentin
16	0	0	20	Typical extreme changes in the odontoblasts and dentin
17	0.5	0	10	Typical moderate changes in the odontoblasts and dentin
18	0.5	0	20	Typical marked changes in the odontoblasts and dentin

[1] Fed by pipette as ascorbic acid solution, supplementing the standard Sherman diet: rolled oats and wheat bran, heated skim milk powder, butter fat, yeast, salt, and a vitamin A & D supplement.
[2] Single intraperitoneal injections of 0.4 m.l.d. each, or two such injections 3 days apart.

teeth of animals receiving only 0.8 mg. per day of ascorbic acid. The need for maintaining a vitamin C intake above that required for normal growth and external evidence of adequate nutrition is clearly indicated.

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Utilization of Available Resources in the Control of Tuberculosis*

W. C. WILLIAMS, M.D., F.A.P.H.A.

Commissioner, Tennessee Department of Public Health, Nashville, Tenn.

IT is unfortunate for the human race that excruciating pain is not a predominant symptom in tuberculous infection and disease and that the development of clinical symptoms is so insidious instead of being the sensational type that leaves mute and unmistakable evidence of its attack or that brings quick certain death once the infection has become active. The presence of rabies, even in animals, causes an immediate and insistent public demand that drastic control measures be instituted because clinical rabies means indescribable suffering and certain death; poliomyelitis kills or cripples to the extent that the public also fears this disease and its after effects. If pain, crippling, and sudden death were the rule in early tuberculosis it would be a matter of perhaps not more than two generations until tuberculosis would become practically nonexistent.

Hippocrates stated centuries ago that the consumptive comes from the consumptive. Koch announced some twenty centuries later—in 1882 to be exact—that the tubercle bacillus was the specific cause of tuberculosis. It is an accepted fact that infection and, in turn, tuberculous disease result from exposure to the active open case of tuberculosis even though there are still many "dead ends" in our knowledge of the epidemiology of tuberculosis. The infection or disease status of the individual can be determined by simple and relatively inexpensive diagnostic procedures. There are accepted and reasonably effective methods for the prevention and cure of tuberculosis. Yet despite the knowledge of accepted principles and facts in the prevention, diagnosis, and cure of tuberculosis, the average person takes little or no cognizance of the seriousness of the situation until the stricken individual becomes incapacitated and has sown a fertile plant-bed for future cases among his immediate household and close associates. Instead of taking too many things for granted and doing little or nothing about most of them, as has been done in the past, except as they may come within our fields of particular interest, we must strive to bring together all available and potential resources into a well planned, continuous and concentrated program for the control of a disease that should be reduced to a minimum in two generations.

An effective tuberculosis control program must not only provide for the finding and care of the individual patient, but must give particular attention to measures for family and community protection. *Prevention at the source* must be the first objective and is attainable only if we control the infective agent at its source, the human body. All groups directly or indirectly con-

* Read before the Southern Branch American Public Health Association at its Eighth Annual Meeting in Memphis, Tenn., November 21, 1939.

cerned with the promotion of the control service must be brought into the picture. Where should we begin? Hippocrates gave us the answer to this question centuries ago. Koch confirmed it a little more than a half-century ago. It was not until well after the turn of the present century that any marked effort was made uniformly to collect, study, and use specific data on tuberculosis in planning control programs. We should begin immediately to use available morbidity and mortality data on tuberculosis as the basis for planning the case finding, case care, and case prevention service. All groups —general and special public health staffs, private physicians, general and special hospitals, teacher training schools, official appropriating bodies, school teachers, farm and home demonstration agents, welfare workers, etc.— have and should assume certain direct or indirect responsibilities in the control of tuberculosis.

The local *health department* staff has access to all homes and direct contact with all groups concerned directly or indirectly with tuberculosis control, hence the local *health officer* is the logical person to act as local coördinator of the case finding, case prevention, and case care activities of his official jurisdiction. Much improvement can and must be made in the collection and use of morbidity and mortality statistics data by local staffs. Where there is no local health department the state staff must be prepared to promote the program.

The private physician must be encouraged to give more attention to the diagnosis and care of early tuberculosis. The family of the tuberculous case must be treated as a case unit. The value of tuberculin testing infants and very young children routinely in families where there is a known or suspected case of tuberculosis should be stressed. A positive tuberculin test in an infant should be regarded as a serious indication for the child and fairly conclusive evidence that there is a sputum-positive case among the household or close contacts. A negative tuberculin does not necessarily indicate absence of active tuberculosis in a given household. Diagnostic assistance must be made available to private physicians for the cases that are unable of themselves to provide it. Collapse therapy offers much hope for carefully selected cases but should be used only by those who know the technics and contraindications as well as indications for each. Money spent in training private practitioners in the diagnosis and management of tuberculosis will be a good investment. We must consider not only plans for stimulating more interest in tuberculosis control among those not now interested but make an immediate effort to improve the work of those now doing some special work in this field.

Consideration of the possible uses of general and special hospital facilities provokes interesting points of view and should be preceded by an inventory and study of existing facilities. The general and special hospitals have a definite place in the control program. Most surveys reveal that there are many unused beds in the general hospitals; also, that there is much prejudice among general hospital administrators about admitting tuberculosis cases, as such, to these institutions. All agree that the general hospitals should not be used for strictly custodial care of tuberculous patients, but since tuberculous patients are admitted for all other types of service there is no plausible excuse for refusing admission when the case requires only a short period of hospital care for the institution of some form of collapse therapy. This program is worthy of a careful trial even where special hospital facilities are available and particularly where the limited number of beds in the special institutions

and transportation considerations restrict institutional service largely to the group requiring an extended period of hospitalization.

A practical point of consideration is the difficulty of getting the incipient, ambulatory case to agree to go to the sanatorium. As a rule he will agree to go to the general hospital much earlier than to the sanatorium. Pneumothorax affords a cause for some optimism in the well planned control program and particularly so where cases are found early. However, it must not be considered as the final solution to our problem. It can be made a valuable aid if properly utilized. It will do more harm than good in the hands of untrained men.

The responsibility for providing funds for tuberculosis control lies with the official state and local appropriating bodies since funds from philanthropic and voluntary agencies are not sufficient to meet local needs for a limited and sustained program. Economic as well as humanitarian considerations must be brought into the picture. It can be shown that failure to provide facilities for the detection, care, and prevention of tuberculosis results in an unnecessary loss of earning capacity usually at the most productive period of the individual's life. It is exceedingly costly to care for these unfortunates and their families while the wage earner is incapacitated, and to bury some of them after they are dead. The public is paying far more in loss of earning capacity and in dependency claims incident to tuberculosis alone than the entire appropriation for all public health services. The wise expenditure of public funds for tuberculosis control is a sound investment in the future well-being of the human race.

Our teacher-training institutions have been prone to teach health in an academic sort of way with comparatively little attention being given to the development of methods or materials for practical health teaching. Let's quit studying blueprints of the human body and devote the time to studies of the development and maintenance needs and protection of the machine. The teaching of the basic principles of healthful living must be incorporated in the elementary school curricula, particularly in the lower grade levels. Time and money can be wisely spent in improving methods and facilities for sound health teaching in this group. They must be prepared for the critical period that is ahead. Beginning with the high school age group, specific instruction in the preventable diseases can be integrated with instruction in the general sciences, home economics, history, etc. There is probably no single group where a tuberculosis educational program would be more effective than in the high school age group. It is an ideal group in which to use the tuberculin test and x-ray of positive reactors as a sort of follow-up to the preliminary program of subjective teaching because they are just reaching the age where tuberculosis will become an increasingly serious problem. The state and local health and education officials cannot afford to ignore the possibilities of well planned general and specific health educational programs as a component part of the school curricula.

Reports by welfare agencies reveal that tuberculosis is a major cause of dependency as a result of death or incapacitation of the family bread winner. Proper food is one of the most important elements in tuberculosis control. Many of these families have facilities for producing more foodstuffs for home consumption but lack knowledge of what is needed and methods of preservation. The services of farm and home demonstration agents have never been specifically utilized but should be used to good advantage in planning the pro-

duction, preparation, and preservation of essential foodstuff in many of these families. If one is inclined to give this particular possibility a second thought, there are many things that should cause us to feel that a good bet has been consistently overlooked in the past.

There are promotional and field services that must be sponsored at the state and local levels by the official public health agencies. In areas without full-time health service the state health department must assume some responsibility for guiding the local programs. The state department should take the initiative in the bringing together and utilization of the resources of all agencies, state and local, in the most effective way. Their proper utilization is directly dependent upon the ability of state and local health personnel to develop teamwork among all groups. The state departments of health and education must work together in planning the content and use of teaching material in the schools throughout the state if we are successfully to combat the existing false belief among the people that tuberculosis is a hereditary disease with a hopeless outlook.

Briefly, what can be done and how?

1. The records of the sick and recent dead can be used as the starting point of an intensive early case finding service. Their families must be studied as a unit. There is good cause to believe that a biennial survey of the high school group will reveal a sufficient number of active tuberculosis cases to justify the time and expense involved in the survey to say nothing of the practical educational possibilities.

2. Diagnostic assistance—clinical and x-ray service—should be made readily available to practising physicians and local health departments. Local health officers must be taught to conduct their own screen clinics, utilizing local facilities, if any, instead of depending upon the state agency to do all the diagnostic work for them.

3. Positive cases, particularly the incipient case and sputum positive case, should be brought under medical supervision as soon as found. If treatment is to be carried out in the home, intelligent nursing follow-up service is essential for protection of the family contacts and to a degree for the care of the patient. It is of sufficient importance to state again that all household contacts of active cases and certain types of healed cases should be carefully examined periodically.

4. Special facilities and financial provisions should be made available for training private physicians interested in the control of tuberculosis. Scholarships for well planned courses of training will do much to stimulate more active interest among physicians. Clinical consultant services are as indispensable to a successful program as well trained local physicians.

5. Facilities must be made available in general and special hospitals as indicated for the care of cases requiring special treatment. There is no evidence that the facilities of all general hospitals have been fully utilized as yet.

6. Health and welfare agencies should set up facilities for coöperative planning for the care of cases eligible for any type of public assistance. It is improbable that much can be done about the permanent relief of economic distress; however, lasting benefits will come from teaching people how to live.

7. *Education* is the capstone of the entire program. The extent to which we are able to get the individual citizen, lay and professional and educational groups attuned to an understanding of the problem and its solution, will be the yardstick for measuring permanent accomplishments. Our main hope lies in teaching the younger generation to do and think for themselves and pass their knowledge on to succeeding generations.

Longevity of Eberthella Typhosus in Various Soils*

PAUL J. BEARD, PH.D.

Associate Professor of Sanitary Sciences, Laboratories of Bacteriology and Experimental Pathology, and Sanitary Engineering, Stanford University, Stanford University, Calif.

WITH increasing congestion of population, the steady decrease in unpolluted water supply sources, and with a growing tendency to reclaim polluted waters from sewage plants, and to use more or less completely purified sewage for irrigation, the longevity of intestinal pathogens becomes a question of growing concern.

The present studies report the results of investigations carried on at intervals during the past 4 years upon the length of time that *Eberthella typhosus* is able to maintain itself in soil subjected as closely as possible to conditions approximating those prevailing in nature.

This subject has been a matter of interest almost from the time of Eberth's original report of the causal organism of typhoid fever.

Grancher and Deschamps [1] in 1889 claim to have recovered it from soil after 5½ months. Karlinski [2] in the same year reported a 3 months' survival in natural soil. Dempster [3] reported survivals of from 12 to 42 days in various types of soil. Pfuhl found a survival of 28 days in dry soil and 88 days in moist.

Robertson [4] added bouillon cultures to unsterilized soil and claimed to have isolated the organisms after 315 days and from natural soil after 86 days. Martin's [5] data indicated a possible survival of 404 days. Death was more rapid in sterilized soil. In pure peat soil the organisms could not be recovered after 24 hours. Firth and Horrocks [6] found that laboratory and freshly isolated strains survived 55 and 32 days, respectively, in unsterilized soil.

Rullmann [7] recovered viable organisms from organically polluted soils after 100 days when the soil was unsterilized and after 16 months in similar sterilized soil.

Sedgwick and Winslow [8] reported over 99 per cent destruction in dry soil in 2 weeks with a longer survival in moist soil. Smith [9] believed *Eberthella typhosus* would live only a short time in unsterilized soil and a little longer in sterile. Mair [10] reported to the contrary claiming survivals of 42 and 74 days in unsterilized and 9 days in sterile soil. Kligler [11] in perhaps the best organized and most exhaustive series of experiments of all reported survivals of 80 days under certain conditions. His experiments, however, appear to have been carried out under controlled rather than under natural conditions.

On one point the investigators are in accord, that moisture plays an important rôle. With the exception of Kligler's work it is difficult to evaluate

* Read before the Laboratory Section of the American Public Health Association at the Sixty-eighth Annual Meeting in Pittsburgh, Pa., October 20, 1939.

TABLE 1

Eberthella Typhosus per Gram Soil

Rainy Season 3.2 Inches of Rain

Soil	Initial	1 Day	2 Days	7 Days	14 Days	21 Days	28 Days	35 Days	42 Days	49 Days
Adobe	16,000,000	12,000,000	8,200,000	1,000,000	80,000	22,000	3,000	650	40	0
Adobe peat	15,000,000	10,000,000	9,500,000	2,000,000	200,000	50,000	7,000	800	250	0
Loam	16,000,000	11,500,000	9,000,000	3,500,000	600,000	75,000	10,000	950	300	95
Sand	22,000,000	5,000,000	50,000	10	0	0	0	0	0	0
Peat	14,000,000	100	0	0	0	0	0	0	0	0

Dry Season 2.0 Inches of Rain

Soil	Initial	1 Day	2 Days	7 Days	14 Days	21 Days	28 Days
Adobe	25,000,000	11,950,000	7,000,000	800,000	50,000	10	
Adobe peat	23,000,000	11,500,000	8,000,000	900,000	75,000	10,000	50
Loam	23,000,000	11,650,000	7,500,000	500,000	10,000	75	
Sand	20,000,000	1,000,000	1,100				
Peat	26,000,000	25	0				

much of the earlier work. Technics in many cases were still comparatively new and crude and the conditions of the experiments have not always been clearly discernible.

The observations reported in this paper constitute part of a program of studies on the longevity of typhoid organism exposed to a variety of natural conditions. Survivals in sea water and in sewage have been previously reported.[12, 13]

The data that follow are derived from our attempts to gain an approximation at least of the length of time massive inocula of typhoid organisms would survive in four types of soil during rainy seasons and during seasons practically free from rain, together with certain other related factors.

Adobe, adobe-peat-moss mixture garden loam, sand and straight peat moss were first investigated. Portions of the soil were placed in unglazed clay flower pots suspended over containers of 5 per cent lysol and placed out of doors in such a position that they were exposed to rains at any time and to sun about two-thirds of the day. Initially the soils were adjusted to approximately the same moisture content (20 per cent) and inoculated with saline suspensions from 24 hour agar slants. The organisms were distributed as evenly as possible through the upper 4 inch stratum. At intervals, 5 gm. of soil were removed, shaken up in 95 cc. of saline filtered and the organisms per gm. of soil determined.

In investigations of this nature we have found the Wilson-Blair bismuth sulfite [14] agar to be of great assistance, since *Eberthella typhosus* stands out as a startling jet black colony and the majority of other types are inhibited or eliminated altogether. Counts of typhi on this medium and plain agar are comparable. Originally, we prepared our own media with which at times we had difficulty, but in the present studies the Digestive Ferments Company * dehydrated product was used and found to be entirely satisfactory.

Equal weights of the various soil types were held at a constant temperature of 20° C. for 48 hours to observe the rate at which moisture was lost. All soils were then adjusted to approximately the same initial moisture content. There was probably some error in the results due to differences in volume and area. This would be more noticeable in case of the peat which oc-

* The author wishes to acknowledge the courtesy of the Digestive Ferments Company for their generous contribution of the media used in these studies.

TABLE 2

Soil	Per cent Death First 24 Hours Season: Wet	Per cent Death First 24 Hours Season: Dry	Per cent Loss * Moisture 48 Hours 20° C.	Days Known Survival: Wet	Days Known Survival: Dry
Adobe	25	45	5.0	42	21
Adobe peat	30	50	5.3	42	28
Loam	28	45	6.0	49	21
Sand	70	95	12.0	8	4
Peat	99.99		9.5	1	2

* Initial moisture = 20%

Average Maximum temperature
Wet Season 58
Dry Season 74

Average Minimum temperature
Wet Season 39
Dry Season 54

cupied a considerably larger volume, for example, than the adobe. Initially, the adobe suffered the least moisture loss, but as drying continues, this soil shows a great tendency to open up cracks and fissures.

The data from four sets of observations, two during California rainy seasons and two during dry seasons, are shown in Tables 1 and 3. The behavior in the first three soils is quite consistent throughout the series.

SUMMARIZING THESE DATA

The survival in all types of soil was greatest during the rainy season when moisture was occasionally added by the rains and when the rate of evaporation was low. The adobe-peat and loam held their moisture with greater tenacity than the adobe. In sand where drying was rapid the survival time was very short—between 4 and 7 days The rapid death in peat cannot be explained upon the same basis. Infusions of this peat indicated a pH of between 3 and 4, so that may be the answer. The experiments during the dry season demonstrate the same tendency, the essential difference lying in the shorter survival time. The effect of moisture on survival is brought out sharply in the second experiment (Table 3) where with a longer rainy season the survival is almost tripled. The effect of moisture retaining capacity is indicated by comparing the survivals in sand, sand-loam mixture, and loam.

Table 2 indicates certain additional observations having a bearing on soil properties and organism behavior during the first experiment.

TABLE 3

Eberthella Typhosus per Gram of Soil

Rainy Season 10.1 Inches of Rain

Soil	Initial	1 Day	15 Days	30 Days	45 Days	60 Days	75 Days	90 Days	105 Days	120 Days
Adobe	20,000,000	17,000,000	3,000,000	1,000,000	500,000	25,000	5,000	900	15	0
Adobe peat	21,000,000	17,800,000	3,200,000	900,000	500,000	17,000	3,000	400	0	0
Loam	20,500,000	17,200,000	2,900,000	950,000	480,000	20,000	4,500	500	30	3
Sand	21,000,000	7,000,000	250	0						
Loam sand	20,300,000	15,000,000	2,000,000	300,000	25,000	125	0	0	0	0

Dry Season 0.7 Inches of Rain

Soil	Initial	1 Day	2 Days	7 Days	14 Days	21 Days	28 Days	35 Days	42 Days
Adobe	23,000,000	13,000,000	5,000,000	600,000	30,000	450	25	0	0
Adobe peat	22,000,000	11,000,000	5,500,000	700,000	42,000	7,000	300	75	2
Loam	22,500,000	11,800,000	6,000,000	600,000	45,000	2,500	150	23	15
Sand	22,000,000	1,200,000	950	2	0				
Loam sand	22,000,000	8,000,000	2,000,000	100,000	75	0	0	0	0

Observations on the Durability of Mottled Teeth

MARGARET CAMMACK SMITH AND H. V. SMITH
University of Arizona, Tucson, Ariz.

FLUORINE ingestion as the cause of mottled enamel which is endemic in many parts of this country and the rest of the world has been well established.[1, 2, 3]

The observation made by Black [4] in 1916 that mottled teeth appeared to have less caries than so-called normal teeth, has recently received much attention. Dean, *et al.*,[5] have reported that the incidence of caries was appreciably less in the mottled teeth of the 12, 13, and 14 year old children in Galesburg and Monmouth, Ill., schools than in the same age group of the nearby communities of Macomb and Quincy, where mottled enamel was not endemic. Dean and his coworkers, although apparently convinced that the higher fluorine content of the waters of the former cities accounted for the lower incidence of dental caries, were somewhat hesitant to conclude that the fluorine content of the water was the only factor involved because of other differences in the mineral composition of the water supplies, primarily in the amount of calcium and magnesium.

Miller reported experiments with rats in which caries development was inhibited by the inclusion of 250 p.p.m. of sodium fluoride in the caries producing ration. Cox [6] has more recently produced mottled enamel in rat molars, and reports that such teeth are more resistant to caries produced by a corn meal ration, than were the molars formed without the addition of sodium fluoride to the ration. Cox [6] makes rather sweeping conclusions and very broad recommendations for the application of his findings made on rats to the dental ills of the human race. He goes so far as to state that addition of fluorides to community water supplies provides an "attractive means of mass reduction of dental caries; that prophylactic measures through other media such as bottled water, milk supply, and fluorine containing medicinals are feasible; and that means of control of fluorine in the whole dietary of children should be undertaken."

To one who is familiar with the disfiguring dental defect known as mottled enamel which affects the teeth of every person who drinks water containing as little as 1 p.p.m. of fluorine during the years of tooth formation, this recommendation seems, to put it mildly, unsafe. There is ample evidence that mottled teeth, though they be somewhat more resistant to the onset of decay, are structurally weak, and that unfortunately when decay does set in, the result is often disastrous. The chart graphically presents the result of a survey of the situation in St. David, Ariz., a community where water supplies range from 1.6 to 4.0 p.p.m. of fluorine. This survey included the

A duplicate experiment carried on during the dry season with 0.3 inches of rain showed less difference, the fecal suspension dying in 27 days and the saline in 33 days.

Pursuing this possibility further, an inoculated soil was thoroughly wet with raw settled sewage and exposed with a control. No viable typhoid organisms could be recovered from the pot wet with sewage after the 45th day, whereas they were recoverable from the control pot up to the 85th day. The rainfall during this experiment totaled 8.1 inches. The pH of the soil in pot wet with sewage rose to 8.8 during the experiment, while that of the control remained at 7.8. Microscopic examination showed the presence of numerous protozoan types of organisms. No attempt was made to evaluate the factors of pH and protozoa. It is possible that those two factors may be too intimately related to consider separately.

The experiment was varied by inoculating solid feces heavily with typhoid organisms. These were lightly covered with earth and exposed outside. Viable typhoid bacilli could be recovered on the 30th day but not on the 35th day during a rainy season, and the 15th day, but not on the 20th day during the dry season.

In studying the significance of hydrogen ion concentration garden loam buffered to pH values of 6.5, 7.0, 7.5, and 8.0 were set up in pots and exposed out of door as before. Table 5 shows the results of experiments.

In general it is seen that variations between pH 6.5 and 7.5 are of little significance, that the loam provided a slightly better menstruum for survival than adobe peat mixture, and that the pH effect was relatively less pronounced in the dry season.

Loam at pH 7.0 was inoculated with approximately 18 million *Eberthella typhi* per gm., was sealed in a series of tubes, and placed in the freezing compartment of an electric refrigerator and examined at intervals of 6 months. Counts after 6 months showed a 70 per cent reduction, after 12 months a 95 per cent reduction, after 18 months over 99 per cent reduction. An occasional viable organism could be recovered after 24 months. In feces similarly stored no viable typhi could be demonstrated after 12 months.

SUMMARY

The longevity of *Eberthella typhosus* in soils exposed to natural conditions has been studied over a period of 4 years.

The most important apparent factor determining survival was moisture. This confirms the conclusions of other earlier investigators. This is directly related to the amount of rainfall, the moisture retaining power of the soil, and to temperature. Fifty per cent of typhoid bacilli will probably die during the first 48 hours. Survival of the remainder may extend over a period of months depending upon the conditions noted above.

TABLE 5

Effect of Soil pH on Survival of Eberthella Typhosus

	Days Survival			
	Rainy Season 6.3 Inches Rain		Dry Season 0.3 Inches Rain	
pH	Loam	Adobe-peat	Loam	Adobe-peat
6.5	80	75	29	25
7.0	87	77	30	27
7.5	105	100	36	30
8.0	90	81	25	21

Sunlight also exerts a definite lethal action, although its effect will be limited to surface pollution.

The survival is longer in natural soil than in sewage polluted soil. Death occurs more quickly in soil impregnated with fecal suspensions than with saline suspensions.

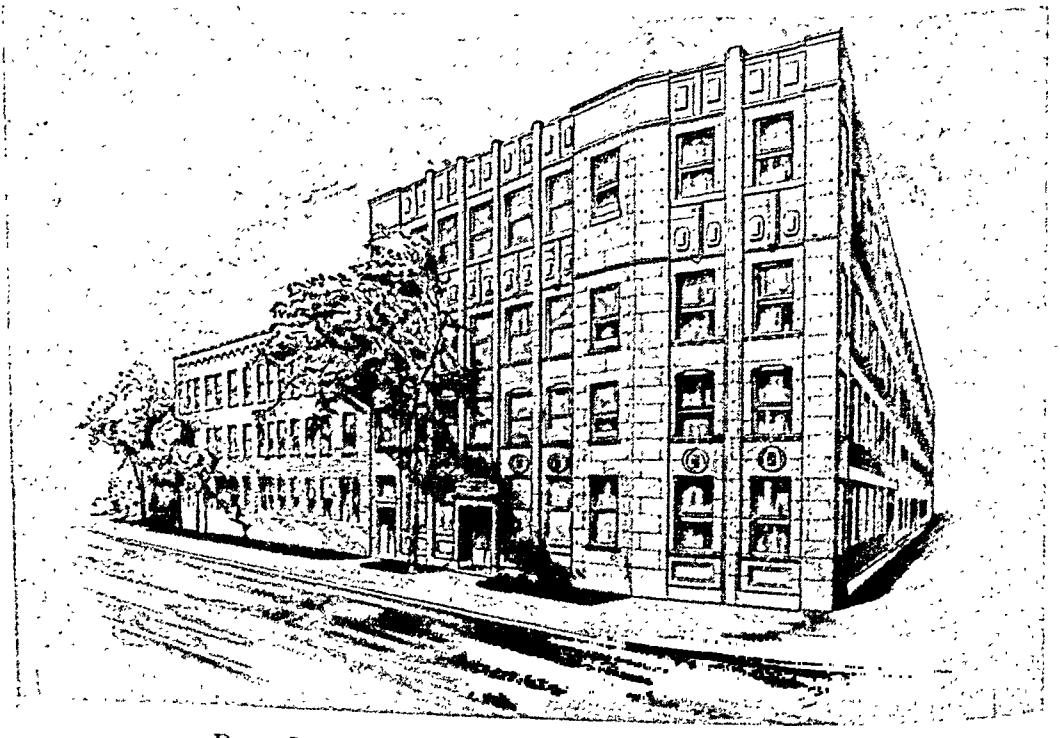
There was no evidence of antagonistic action by soil organisms such as *Pseudomonas fluorescens* and *Proteus vulgaris* in a soil environment.

The pH of soil can affect survival adversely, but does not seem to be important in the pH range of ordinary fillable soils.

Eberthella typhosus stored in moist soil at freezing temperature may survive as long as 24 months. In feces similarly stored the survival time is much shorter, but may, nevertheless, extend over several months.

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The many friends of this organization will put a visit to their headquarters on their "must" schedule while they are attending the Annual Meeting.

Wilson Method for the Bacteriological Examination of Water

RAÚL FERRAMOLA

Laboratories of Obras Sanitarias de la Nación, Buenos Aires, Argentine

AMONG the numerous methods proposed for determining the coliform count of water the two most widely used are those of the American Public Health Association and the British Ministry of Health.

In the American Standard Method the water is inoculated into lactose broth; tubes showing gas are plated on Endo or eosine-methylene-blue agar; and one or more typical colonies are picked off into lactose and studied microscopically to see whether the contained organisms have the morphological and staining properties of coliform bacilli. By this means it is possible to determine the number of coliform bacilli present in the water, but not to form any idea as to whether these organisms belong to the fecal coli, the intermediate-aerogenes-cloacae, or irregular type.*

In the British Ministry of Health (1934) method, lactose broth is replaced by MacConkey's broth. Since this medium has a high degree of selectivity on account of the incorporation of 0.5 per cent bile salt, it is usual to accept the presumptive coliform count obtained in this way as the real coliform count. Differentiation, however, of the coliform bacilli is advised in certain circumstances which are carefully defined. This is carried out by plating one or more of the positive tubes on MacConkey agar, picking off three colonies from each plate, and submitting them to the methyl red (M.R.), Voges-Proskauer (V.P.), indol, and citrate tests.

In practice the American method suffers from the disadvantage that the presumptive coliform count in lactose broth is accompanied by a large error due to false positive reactions, and no differentiation is made between the types of coliform bacilli present. The Ministry of Health method, though free from these particular disadvantages, nevertheless uses a method of differentiation which is itself open to objection.

In the first place, if the various types of coliform bacilli differ greatly in number, and plates are made only from the tubes inoculated with the smallest quantities of water, the probability is that only one type will be revealed.

In the second place, even if the various types are more or less equal in number, it is very common for *Bact. coli* to outgrow *Bact. aerogenes* and other types in the MacConkey broth

* EDITOR'S NOTE: The classification of coliform organisms employed by the author is that of the British Ministry of Health. The group designated as "*Fecal coli*, or *Bact. coli I*" comprises those coliform organisms that give positive results with the methyl red, Voges-Proskauer, indol tests and gas in MacConkey broth at 44° C., but negative results with the citrate and the gelatin liquefaction 7 day tests. The group "*Bact. coli II*" comprises those coliforms that give a positive methyl red test, but negative results with all the other tests; their probable habitat is indicated as "doubtful, probably not primarily intestinal." The other designations are rather similar to those used in America, but complete details may be found in author's Reference No. 4, or *J. Am. Water Works Assn.*, 31, 7:1233 (July), 1939.

tubes. Consequently plates made from the fermented tubes often reveal a pure culture of *Bact. coli,* even when other coliform types were present originally. The colonies on the plates correspond, in fact, not to the types present in the original water, but to types present in the fermented MacConkey broth tubes.

To overcome the first disadvantage, it would be necessary to plate out every positive tube on MacConkey agar or other suitable medium, and to submit three or more colonies from each plate to the M.R., V.P., indol, and citrate tests. Though possible with some waters, this would often involve more labor and cost than could well be afforded in practice.

To overcome the second disadvantage, nothing but the use of highly selective media which would allow the development of different types of organisms, even if present in minimal numbers, would be of any value.

An attempt to overcome these two difficulties was made by Wilson and his colleagues (1935) in London, when engaged in a study of the bacteriological grading of milk. The method they devised, which is referred to as Method IV, consists essentially in the use of two selective media, one for the demonstration of *Bact. coli* I (see Table III), the other for the demonstration of the intermediate, *Bact. aerogenes,* and *Bact. cloacae* types (I.A.C.).

In practice the water is inoculated into MacConkey broth, as in the first step in the Ministry of Health method, so as to obtain the presumptive coliform count. *All* tubes showing acid and gas within 48 hours are inoculated into (1) tubes of MacConkey broth, and (2) tubes of Koser's citrate medium. The MacConkey broth tubes are incubated at 44° C. in a thermostatically controlled water bath; under these conditions with few expections, only strains of fecal coli give rise to *gas* formation. The citrate tubes are incubated at 37° C.; in this medium strains of I.A.C. type, but not usually *Bact. coli* I, develop. The 44° C. MacConkey tubes showing gas formation afford an index of the probable number of fecal coli, and the citrate tubes of the probable number of I.A.C. types present in the water.

This method is very simple and rapid. It enables not only a presumptive coliform count, but a differential count, to be completed within 3 or 4 days. It has been tried out on water with very favorable results by Bardsley (1938) at Manchester and, together with suggested modifications, is described in the latest edition of the Ministry of Health memorandum (1939) on the bacteriological examination of water supplies. Reference should be made to this publication for a full description of the method and its interpretation.

Since learning of this method in England, we have examined about 10,000 samples of water in the Argentine with highly satisfactory results. In addition, we have carried out certain controls of the main steps of the Wilson method. These we propose to describe in the following pages.

CONTROL OF THE PRESUMPTIVE COLIFORM COUNT IN WATER USING MAC CONKEY BROTH AT 37° C.

Tubes of MacConkey broth showing acid and gas formation at 37° C., which had been seeded with the smallest quantity of water, were plated on MacConkey or eosine-methylene-blue agar, and incubated for 24 hours. Coliform-like colonies were picked off, and studied for their morphological and staining properties and for their ability to form gas in standard lactose broth. They were also examined by the 44° C. MacConkey and the citrate tests. In this way 430 fermented MacConkey broth tubes were checked. The results are given in Table 1.

TABLE 1

The Accuracy of the Presumptive Coliform Count in MacConkey Broth at 37° C.

Origin of Water Samples	Fermented MacConkey Broths: 24 Hours: Controlled	24 Hours: Confirmed	24 Hours: Percentage Confirmed	48 Hours: Controlled	48 Hours: Confirmed	48 Hours: Percentage Confirmed
Surface (rivers)	77	77	100	231	205	89
Underground (wells)	19	16	84	103	81	79
Total	96	93	97	334	286	86

Total controlled (24 and 48 hours)..... 430
Total confirmed (24 and 48 hours)..... 379
Percentage confirmed (24 and 48 hours).. 88

It will be noticed that the percentage of cultures confirmed was (1) much higher with tubes showing fermentation within 24 hours than in those taking 48 hours, and (2) much higher with surface than with underground waters.

In considering this second observation it may be pointed out that the majority of the surface waters came from Buenos Aires, and were examined within a few hours, whereas all the underground waters came from various parts of the Argentine outside Buenos Aires, and were not examined until, in some instances, 2 days later. This circumstance may also be partly responsible for the fact that 40 out of the 51 false positive tubes contained coliform-like bacilli which failed to produce lactose-fermenting colonies on plates within 24 hours. It seems not improbable that many of these organisms were in reality coliform bacilli whose fermenting properties had become modified by the unfavorable conditions of transport. In support of this explanation is the fact that most of these organisms were derived from polluted waters which had been chlorinated. Some authors would ascribe the same sanitary importance to these organisms as to those of the coli-aerogenes group.

Of the remaining false positive tubes, 5 consisted of coliform bacilli which were typical except in their failure to ferment lactose at 37° C.; all of these produced gas in MacConkey broth at 44° C. In 6 false positive tubes no coliform bacilli could be demonstrated by plating, though Gram-positive rods were sometimes present.

Thus it appears that all but 6 of the false positive tubes contained bacilli which differed from coliform bacilli only in their failure to ferment lactose within 24 hours at 37° C., either on plates or in broth. False positives due to other types of organism were very few, and accounted for only 1.4 per cent of the whole series.

The high proportion of correct results obtained with MacConkey's medium is in agreement with the findings of many other workers who have had extensive experience of this medium, such as Bardsley (1938) in England, and Raghavachari and Iyer (1936) in India. It may be noted that from 550 waters producing acid and gas in MacConkey broth at 37° C. Bardsley was able to isolate coliform bacilli in every instance. Not a single false positive due to non-coliform bacilli was encountered.*

* EDITOR'S NOTE: See also this *Journal*, 29, 11, 1250 (Nov.), 1939.

CONTROL OF THE FECAL COLI COUNT IN WATER USING MAC CONKEY BROTH AT 44° C.

As in the previous experiments we examined tubes of MacConkey broth showing acid and gas at 44° C. by plating on MacConkey or eosine-methylene-blue agar, picking 3 colonies, and testing them by the M.R., V.P., citrate, and indol tests. The 44° C. MacConkey broths had been inoculated directly from fermented 37° C. MacConkey broths which had been seeded with the smallest quantity of water. In this way we checked 309 positive 44° C. tubes with the results shown in Table 2.

ing 6 no growth was obtained on solid media. In other words, the 44° C. MacConkey test yielded correct results in at least 95 per cent of tubes.

Of practical interest is the fact that 95 per cent of the tubes fermenting MacConkey broth at 44° C. did so within 24 hours, thus enabling differentiation to be made in 2 to 3 days from the primary inoculation of the water.

CONTROL OF THE SPECIFICITY OF THE 44° C. MAC CONKEY TEST FOR FECAL COLI IN SEWAGE AND FECES

Sewage from Buenos Aires and animal feces from various sources were plated on eosine-methylene-blue agar

TABLE 2

The Accuracy of the Fecal Coli Count in MacConkey Broth at 44° C.—Water 44° C. MacConkey Broths Inoculated from MacConkey Broths That Had Fermented at 37° C. in

Origin of Water Samples	24 Hours			48 Hours		
	Controlled	*Confirmed*	*Percentage Confirmed*	*Controlled*	*Confirmed*	*Percentage Confirmed*
Surface (rivers)	205	199	97	49	47	96
Underground (wells)	42	40	95	13	11	85
Total	247	239	97	62	58	94

Of the 309 tubes fermenting MacConkey broth at 44° C., 294 yielded *Bact. coli* I (fecal), 3 *Bact. coli* II, and 4 intermediate, *Bact. aerogenes*, or irregular strains, while from the remain-

and incubated for 24 hours at 37° C. Typical colonies were picked off and tested by the M.R., V.P., citrate, indol, and 44° C. MacConkey broth tests. The organisms were grouped according

TABLE 3

[illegible] 44° C. MacConkey Broth Test for Fecal Coli: Sewage and Feces

			Feces from					
		Sewage	*Fowl*		*Equine*		*Cattle*	
	Positive	*No. of Positive Strains at 44° C.*	*No. of Strains*	*Positive at 44° C.*	*No. of Strains*	*Positive at 44° C.*	*No. of Strains*	*Positive at 44° C.*
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	65	65	504	492
[illegible]	[illegible]	[illegible]	1	1	0	0	0	0
[illegible]	[illegible]	[illegible]	0	0	0	0	0	0
[illegible]	[illegible]	[illegible]	0	0	0	0	0	0
[illegible]	[illegible]	[illegible]	1	0	0	0	1	0
[illegible]	[illegible]	[illegible]	0	0	0	0	0	0
[illegible]	[illegible]	[illegible]	0	0	0	0	0	0

[illegible] the Brazilian [illegible]

to the classification given by the Ministry of Health (1939). Altogether 222 colonies from sewage and 850 colonies from feces were examined. The results are recorded in Table 3.

Of 963 strains classified as *Bact. coli* I, all but 6 produced gas in MacConkey broth at 44° C., while of 105 other coliform strains, excluding 4 strains of *Bact. coli* II the fecal origin of which is in some doubt, not a single one did so. It would be unreasonable to demand a greater degree of specificity for any test.

The 44° C. MacConkey broth test thus affords a rapid and accurate method for differentiating *Bact. coli* I, the typical inhabitant of the intestine, from other coliform organisms whose primary habitat appears to be most frequently outside the animal body.

CONTROL OF THE INTERMEDIATE-AEROGENES-CLOACAE COUNT IN WATER USING KOSER'S CITRATE AT 37° C.

Positive cultures in Koser's citrate medium, which had been seeded from fermented MacConkey broth tubes inoculated with the smallest quantity of water, were plated on eosine-methylene-blue agar. Three colonies were picked off 24 hours later and studied in the usual way. The results are recorded in Table 4.

A considerable difference was noticeable between citrate-positive tubes inoculated from 37° C. MacConkey broths that had fermented within 24 hours and those that had taken 48 hours. In 92 per cent of the former coliform bacilli were found, but in only 61 per cent of the latter. The reason for this difference is not clear.

Examination of the colonies that developed on plates streaked from the false positive citrate tubes showed them to consist of non-lactose-fermenting Gram-negative coliform-like bacilli. What were these organisms? Were they non-lactose or late lactose-fermenting bacilli which were present in the original water, and which developed particularly during the second day of incubation of the 37° C. MacConkey broths, or were they organisms of the I.A.C. group that had temporarily lost their power of fermenting lactose within 24 hours?

Our observations were not sufficiently extensive to answer these questions, but it seems probable that many of the organisms belonged to the second class. For example, analysis of 142 false citrate positives showed that 108 had been inoculated from 37° C. MacConkey broths which had failed on subculture to produce gas in MacConkey broth at 44° C. In other words, the 108 37° C. MacConkey broths contained no fecal coliform organisms, and the fermentation of lactose in these tubes must have been due

TABLE 4

The Specificity of Koser's Citrate Medium for Organisms of the I.A.C. Group—Water Positive Citrate Tubes Inoculated from 37° C. MacConkey Broths Showing Fermentation at

	24 Hours			*48 Hours*		
Origin of Water Samples	*Controlled*	*Confirmed*	*Percentage Confirmed*	*Controlled*	*Confirmed*	*Percentage Confirmed*
Surface (rivers)	64	59	92	151	86	57
Underground (wells)	36	33	92	191	122	64
Total	100	92	92	342	208	61

to organisms of the I.A.C. group, or to some non-coliform type of organism. Since examination of Table 1 shows that the total proportion of false positives in 37° C. MacConkey broth was only 12 per cent, it is difficult to avoid the conclusion that the great majority of the positive citrate tubes must have contained coliform bacilli, even though their presence could not be demonstrated by direct plating.

It would therefore appear that the relatively high proportion of false positives in Koser's citrate medium seen in Table 4 is more apparent than real, and that the specificity of the citrate test for organisms of the I.A.C. group, while not so high as that of the 44° C. MacConkey test for fecal coli, is nevertheless of a reasonably high order.

It may be noted that, though fecal coli was found on some plates made from positive citrate tubes, it was invariably accompanied by members of the I.A.C. group. That is to say, no false positives in citrate were due to fecal coli.

COMPARATIVE STUDY OF THE AMERICAN STANDARD AND THE WILSON METHODS

Finally we should like to refer to a comparative examination made on 499 waters by the American Standard and the Wilson methods. The samples were collected in Buenos Aires and in other parts of the Argentine. About 70 per cent were from chlorinated supplies.

In recording the results of the Wilson method, we have confined ourselves to the coliform count, since it is this alone which is common to both methods. The differential counts of fecal coli and I.A.C. organisms, which were obtained by the Wilson method, are omitted from Table 5, though the number of tubes giving a positive 44° C. MacConkey and a positive citrate test are included for the sake of interest.

On the whole, the number of samples in which the presence of coliform bacilli was confirmed was remarkably similar in the two methods. The number of discrepant results was 39 in a total of 3,245 tubes inoculated, or just over 1 per cent.

TABLE 5

Comparison of the American Standard and the Wilson Methods

			American Standard Method		*Wilson Method*				*Coliform Organisms*	
Origin of Water Samples	*No. of Samples Examined*	*No. of Tubes Inoculated*	*No. of Tubes + Lactose Broth*	*No. and % of Tubes Confirmed*	*No. of Tubes + 37° C. MacConkey*	*No. of Tubes + 44° C. MacConkey*	*No. of Tubes + Citrate*	*No. and % of Tubes Confirmed*	*Wilson + Standard −*	*Wilson − Standard +*
Surface unchlorinated	111	569	292	198 (68)	228	169	187	200 (88)	4	2
Underground unchlorinated	45	315	43	31 (72)	44	18	31	36 (82)	6	1
Total	156	884	335	229 (68)	272	187	218	236 (87)	10	3
Surface chlorinated	294	1,998	864	119 (14)	140	95	74	128 (91)	15	6
Underground chlorinated	49	363	39	8 (20)	11	2	10	9 (82)	3	2
Total	343	2,361	903	127 (14)	151	97	84	137 (91)	18	8
Grand Total	499	3,245	1,238	356 (29)	423	284	302	373 (88)	28	11

The number of positive tubes was a little higher by the Wilson method, suggesting a slightly greater degree of sensitivity. The reason for this appeared to be due mainly to the failure, in the American Standard method, of typical lactose-fermenting colonies to develop on eosine-methylene-blue agar plates within 24 hours. Two causes seemed to be responsible for this: (1) In some waters containing slow lactose-fermenting organisms, such as in certain well waters, the colonies on plates examined after 24 hours were still colorless, though when incubated for a further 1 to 2 days they developed into typical lactose fermenters. (2) In some waters organisms of the *Pseudomonas* group were common, and these overgrew the coliform organisms on plates and prevented their developing into typical lactose-fermenting colonies. Some of the positive results given by the Wilson method may, of course, have been caused by the growth of non-coliform organisms in citrate, though these do not appear to have been numerous.

Analysis showed that in all but one of the 39 discrepant results, the average number of coliform organisms was only 2.2 per 100 ml. In relatively pure waters of this type the sampling error alone may well have been sufficient to account for many of the discrepancies observed.

It is interesting to note that a very small proportion of fermented lactose broth tubes in the American Standard method were confirmed on plating. With chlorinated waters, for example, this proportion was only 14 per cent. Analysis of the figures obtained with the Buenos Aires waters, which cannot be given in detail here, showed that the proportion was lowest of all with *freshly* chlorinated waters. In one series of 77 fermented lactose broths inoculated from such waters only one tube was confirmed.

DISCUSSION

From the results given in this paper it will be realized that the Wilson method of examining waters is very rapid and affords an assessment not only of the coliform bacilli present, but also of the proportions of *Bact. coli* on the one hand, and of the intermediate, *Bact. aerogenes,* and *Bact. cloacae* types on the other.

The 44° C. MacConkey broth test, *provided it is carried out with the precautions laid down in the Ministry of Health Report (1939),* serves as a most reliable, delicate, and rapid index of the presence of fecal coli.

The use of the citrate test for detecting organisms of the I.A.C. group is less specific, but since the occurrence of these organisms in the concurrent presence of fecal coli is of little help in interpreting the results of the water examination, and since their occurrence in the absence of fecal coli may be regarded as indicative of no immediate danger, and a confirmatory plating test may be made if necessary, this drawback is of less importance than might appear at first sight.

The fact that the Wilson method enables a confirmed and a differential coliform count to be completed in the same time as that required by the American Standard method for the coliform count alone, and the fact that it dispenses with plating and with microscopical examination, are two advantages which justify its trial on a more extensive scale.

SUMMARY AND CONCLUSIONS

1. An attempt has been made to confirm the accuracy of the various steps used in the Wilson method of performing the coliform and differential coliform counts on water. This method, which is simple and rapid, consists in the use of MacConkey broth at 37° C. for the presumptive coliform count, followed by subculture of all fermented tubes into MacConkey broth at 44° C. for the fecal coli count and into Koser's citrate at 37° C. for the intermediate-aerogenes-cloacae count.

2. Control of the presumptive coliform count in MacConkey broth at 37° C. by plating and examination of the resultant colonies was carried out on 430 fermented tubes inoculated from surface and underground waters. Of tubes showing fermentation within 24 hours, 97 per cent were confirmed, while of those not showing fermentation until the second day, 86 per cent were confirmed. The fact that the proportions were higher in samples of Buenos Aires waters, which were examined on the same day, than in waters from other parts of the Argentine, which sometimes required 1 or 2 days to reach the laboratory, suggests that the ability of contained organisms to form lactose-fermenting colonies on plates in 24 hours may have been affected by the unfavorable conditions of transport.

3. Control of the fecal coli count in MacConkey broth at 44° C. in water was made by plating out 309 fermented tubes, picking off colonies, and ascertaining to which type they belonged by the usual differential tests. It was found that 294 contained typical *Bact. coli* I, while 3 contained *Bact. coli* II. At least 95 per cent, therefore, of the results were confirmed.

4. Further control of the 44° C. MacConkey test was made by plating out sewage, animal feces, and bird feces, picking off lactose-fermenting colonies, ascertaining their type by the usual differential tests, and inoculating them into MacConkey broth at 44° C. Of a total of 963 colonies classified as *Bact. coli* I, all but 6 produced gas in this medium, while of 105 other coliform strains, excluding 4 strains of *Bact. coli* II, the fecal origin of which is in some doubt, not a single one did so. The error of the 44° C. MacConkey broth test as an index of fecal coli was therefore less than 1 per cent.

5. The Koser citrate test at 37° C. for detecting the presence of coliform organisms of the I.A.C. group in water was controlled by inoculating 442 fermented 37° C. MacConkey broth tubes into citrate, plating out all tubes showing growth, and studying the colonies in the usual way. Of positive citrate tubes that had been inoculated from 37° C. MacConkey broths fermenting in 24 hours, 92 per cent were shown to contain coliform bacilli, whereas of those inoculated from MacConkey broths not fermenting until the second day, only 61 per cent were confirmed. A large proportion of the false positives in citrate medium were due apparently to the failure of coliform bacilli to produce typical lactose-fermenting colonies or to ferment lactose broth within 24 hours. In other words, the relatively high proportion of false positives was probably more apparent than real.

6. A comparison was made between the American Standard and the Wilson methods on 499 waters, paying attention merely to the confirmed coliform count. The results, on the whole, were in close agreement. In a series of 3,245 tubes inoculated with water, the final discrepancies were only 39 in number, or a little over 1 per cent. The Wilson method was positive 28 times when the American Standard method was negative, and the latter was positive 11 times when the Wilson method was negative. In all but one of the 39 discrepant results, the waters were of a relatively high degree of purity, containing an average of only 2.2 coliform bacilli per 100 ml.

7. In view of the simplicity and accuracy of the Wilson method, and the fact that it gives a differential as well as a confirmed coliform count in the same time as that required by the American Standard method to give a coliform count alone, the method seems worthy of trial on a more extensive scale. During the year 1938 we examined about 10,000 samples of water by this method with highly satisfactory results.

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Health Education through the Ages*

OWSEI TEMKIN, M.D.

Associate Professor of the History of Medicine, Johns Hopkins University, Baltimore, Md.

HEALTH education is as old as medicine. Even in primitive societies parents have to tell their children of the dangers of poisonous snakes and inedible plants and of the ways in which disease may be prevented by placating the wrath of gods and demons. But though health education is as old as education itself, it has nevertheless undergone decisive changes. Not only were the forms and ways of health education of former times different from ours in many respects; its very concept was sometimes contrary to ours. To a medieval ascetic like St. Bernard the sight of crippled and sick people evoked the comforting thought that their sufferings would soon end and real life begin.[1] Toward the end of the Middle Ages death and decomposition were represented in pictures and poems as reminders of the vanity of beauty and health.[2]

It is not possible in a short time to review the entire historical development of modern health education. I shall, therefore, not try to lead you through the ages in an orderly fashion, beginning with prehistoric man and ending with our present meeting at Pittsburgh. Instead I shall group my remarks around two questions: whose was the task to educate, and who was to be educated?

Today, in a democratic country, the aims of health education are democratic too. We try to make everybody health-conscious and to show to everybody how best to preserve his health. This we can do because in our modern society we possess the means through lectures, newspapers, pamphlets, exhibits, moving pictures, and radio to reach even those who have not been trained in biology and who cannot afford the constant attention of the physician.

Now the democratization of health education has been the result of a long and complicated development. In the democratic age of the ancient Greeks we find something similar, though of course on a very limited scale. At least all the people, rich and poor alike, received such advice as the physicians had to give. Among the writings which go under the name of Hippocrates there are several treatises discussing the general causes of health and disease. It is very probable that some of these writings were speeches made by physicians before crowds of people, and one of these books represents the earliest attack against superstitious medicine and the treatment of disease by magicians, sorcerers, and quacks. It deals with epilepsy, which the people called "the sacred disease." It tells the reader, or perhaps the listener, that this is just as natural a disease as all others, curable without magic by purely natural means—provided the cure is begun early.

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But at this time it was already felt that the same kind of medical advice was not valid for everybody. There were people who had to spend their day in work and who, therefore, could observe but relatively few of the hygienic rules laid down by the physician. There were others who could devote their time to following all the minute prescriptions of the Greek physicians. This differentiation we find in Hippocratic authors as well as in Diocles of Carystus, the great physician of the 4th century B.C. It is partly accounted for by the peculiar character of ancient hygiene and medicine. Whereas the prevention of infections plays such an important rôle in modern health education, this point is scarcely recognized by the ancient health educators. Instead, they stress the kind of food to be eaten and to be avoided, the exercise to be taken, and the position to be assumed during sleep. They were chiefly concerned with the correct regimen, and this to a point which must have led to the education of hypochondriacs, people whose days were spent in keeping themselves healthy. It is in continuation of this tendency that in the later days of antiquity we find the Greek physicians in Rome demanding that hygiene should find its place in a liberal education. Comprehensive books on hygiene and medicine were written for the laymen, *i.e.*, the well educated laymen, whereas little was done to educate the mass of the people. This is proved by the fact that most of these writings were composed in Greek, while but few books were written in Latin, the language of the Romans.[2]

With the coming of the Middle Ages, with the passing of government into the hands of barbaric people, health education gradually ceased to be a matter of primary concern. But it by no means stopped altogether. It found a new, though modest, field of activity at the courts of kings, at monasteries and cathedral schools. We still possess the dietetic letter of the physician Anthimus to the Frankish king Theuderich and various short hygienic texts were now addressed to real or imaginary princes. Even the famous "Regimen" of the School of Salerno, which in its literary form hails from about 1300 A.D., belongs in this category, as is seen from the beginning of the poem:

The *Salerne Schoole* doth by these lines impart
All health to *Englands King*, and doth aduise
From care his head to keepe, from wrath his heart,
Drinke not much wine, sup light, and soon arise,
When meate is gone, long sitting breedeth smart:
And after-noone still waking keepe your eyes.
When mou'd you find your selfe to *Natures Needs*,
Forbeare them not, for that much danger breeds,
Vse three Physicions still; first Doctor *Quiet*.
Next Doctor *Merry-man*, and Doctor *Dyet*.[3a]

The importance of this type of literature was very great. Apparently written for a king, it acquires authority. Its Latin language destines it first for the physician and other more educated men. But its poetic form, which appeals so strongly to the ear, assured its propagation over great masses of the people and generations of men. For it was translated into vernacular languages and both a Germań and French version are found among the medical incunabula. The medical incunabula in vernacular languages give us considerable insight into the health education of the later Middle Ages. In Germany alone about 450 items were printed between 1450 and 1500! The bulk of this output was decidedly intended for the average people. It comprised general medical works including pediatrics and advice for pregnancy and childbed, dietetic works on bloodletting, food, beverages, and bathing, often in the primitive form of calendars; tracts on pestilence and syphilis, but also some

popular works on science with reference to medicine and veterinary surgery.[4] The authors were often physicians and surgeons, and a look at the vernacular literature in France,[5] England, and Germany during the 16th century shows the same trend toward the spread of medical information among broad masses of the people.

The work of these early health educators struck deep roots in the people of Europe. It is through popularized verses from the "School of Salerno," through the memory of things read by parents and grandparents in calendars, and through a long oral tradition, that many teachings of a past medical system are still alive today. Such survivals show the responsibility that rests upon health education. Once its teachings have met with popular response they are not easily forgotten and may outlast the generation to which they were addressed and sometimes even their validity.

Another focus of medieval health education is to be found in some early medieval monasteries where the monks set a good example for eating and drinking at a time when people were usually given to gross excesses. During the school reform of the Carolingian period it was ordered that medicine should be included among the subjects of the curriculum. This was a faint reminiscence of the rôle of medicine in the liberal education of the Romans and probably did not reach further than a group of clerics and a few laymen. At this early period the most effective educational work of the church was the fight against superstition. At the Council of Tours (813) it was ordered that the priests should tell the faithful that sorcery and amulets did not cure disease.[6]

It is from the early Middle Ages on that the priest assumed his function as health educator equal to if not surpassing the importance of the physician. This was, of course, not the first time in the history of mankind that the priest took over this rôle. In this connection it may suffice to remember the hygienic significance of many Biblical laws based on the idea of religious cleanliness and going back to the even older religions and customs of Egypt and Babylonia. However this may be, the influence of clerical and religious health education was far-reaching in the Middle Ages and later centuries. Popular preachers like Berthold of Regensburg in the 13th century, as well as Thomas Thatcher in the 17th, gave not only moral instructions to the people but medical advice too. The moral and religious aspect given to health education lasted far into the 19th century and even into our own days. The underlying idea was that "God predestines each human being to a certain span of life. Nothing can extend this span; but sins and follies can shorten it; only through virtue and piety can a man enjoy the full tale of years allotted to him."[7] Moral sins and medical follies thus went together. Disease was often taken as a direct sign of punishment for sin, and imperial and other edicts tried to restore health by commanding a moral and virtuous life to the people. Particularly in the field of venereal diseases, moral exhortations became the strongest though perhaps not always effective means of health education. It became a practice in the 18th century to take young men to the syphilis wards of hospitals to demonstrate the terrible consequences of immorality.

So far we have considered the physician and priest as health educators. Their efforts were supplemented to a certain degree by governmental authorities—to a certain degree only, because the authorities in early times did not so much act as health educators as health legislators.

Down to the end of the 18th century,

governments did not show any great interest in the health education of the people. This is understandable if we realize that in the absolutist states of the time the people were chiefly an object of administration. If the government was benevolent and enlightened, it would provide good medical schools, regulate medical practice, and it would see to it that laws protected the health of the people. This line of thought is reflected in Johann Peter Franck's *System of Complete Health Police.* The whole field of state medicine and public health is discussed, law after law is proposed to keep the people healthy, meddling with many details of daily life. As the title of the book indicates, it is the idea of health enforcement which occupied Franck, and perhaps it was not by chance that he spent much of his life in the absolutist countries of Italy, Austria, and Russia.

Yet in the same 18th century democratic ideas gave a strong impetus to health education. Enlightenment, the catchword of this century, also included enlightenment in matters of health. The fight against superstition in general was also extended against medical superstitions. The popular calendars were reformed; many popular books and even magazines discussed medical subjects for the more educated public. The middle classes who were largely the carriers of the new philosophy could be counted upon to show interest and understanding for medical advice. But the problem remained of how to reach the poor and uneducated. Tissot, a Swiss physician and one of the main representatives of medical enlightenment, hit upon the following idea: The common people, particularly in rural districts, could not be reached directly, and yet their health above all needed improvement. Why not reach them indirectly through the owners of estates, ministers of the church, surgeons, midwives, and school teachers? Let these people be instructed in medicine and let them care for the peasants where no physicians were at hand. Tissot embodied this idea in his famous *Advice to the People in General with Their Health,* a popular textbook of medicine which taught the educated how to treat the uneducated. This book met with great success, but it could not solve the problem. If all the people were to be instructed in matters of health, then it was necessary to provide for the elementary education of all. In other words, it was necessary to spread education and to enlist the teacher as a health educator. Suggestions in this direction had been made several times, but nobody approached the task with such enthusiasm as Dr. Bernhard Christoph Faust in his *Catechism of Health,* which was first printed in German in 1794, and even reached this country in an English translation in 1798. The following "observation" may give us an idea of how Faust tried to make his pupils health-conscious:

> If a child be present who was ill not long ago, the Master will take the opportunity of asking him the following question:—"You was ill; tell me did you feel yourself so happy, so easy as you do now?" To this a sensible child will answer, or will be taught to answer—"I found myself exceedingly ill, I could neither eat, drink, nor sleep; nothing afforded me pleasure or joy; I was full of anxiety and pains; but now restored to health; thanks be to God, I know it is the greatest good." [8]

If this form was dogmatic and sometimes naïve, most of the instructions given were nevertheless sound even from a modern point of view.[9]

The contribution of the 18th century to the development of health education can hardly be overestimated. For even today the work of health education is greatly one of enlightenment. But to the 19th and 20th centuries fell the task of making health education effective and putting it on a broader basis.

If in earlier times physician, priest, and teacher had acted mainly as individuals, the 19th century now witnessed an organization of forces. Associations, both lay and professional, were formed which made health education their aim. In this connection I should like to mention "The American Physiological Society," founded in Boston in 1837, which was not a scientific organization but a group of laymen interested in the discussion and propagation of hygienic ideas.[10] It did not last long, but its work was continued by other agencies too numerous to mention. Government officials, organized medicine, nurses, public health workers, welfare workers, educators, and many others are now engaged upon a task to which the progress of modern medicine gives definite direction. To discuss details of this recent development before you would be a presumption on my part. Let me therefore stop here and apologize for this incomplete sketch of the history of health education. All I could attempt was to indicate a few steps in the development of a great democratic idea.

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. . . Sir Edward Cook once made the assertion: "There is no book so good that it is not made better by an index, and no book so bad that it may not by this adjunct escape the worst condemnation," and he goes on to say: "A friend of Francis Douce, the antiquary, had a curse of his own for those who sent out a book without an index where one was obviously wanted; he damned them 'ten miles beyond Hell.' For my part, I think that simple damnation is enough."—A. T. Mathers, *Mental Hygiene,* April, 1940, p. 317.

Programs for Public Health Nurses in Birth Control Work*

Outline Developed in North Carolina State Board of Health for Staff Education

FRANCES R. PRATT, R.N.
Special Field Nurse, State Board of Health, Raleigh, N. C.

IT is with pleasure that we accept the privilege of submitting for your consideration a brief outline of the birth control program sponsored by the North Carolina State Board of Health, with special attention given to the duties which devolve upon the public health nurse. Needless to say, the interest, intelligence, and training of the nurse is a large determining factor in the success of the birth control program. The North Carolina public health nurses, having realized the need for this service, have coöperated fully in setting up and making workable the various phases of the project.

To review briefly: Two and a half years ago, Dr. Carl V. Reynolds, Secretary-Treasurer and State Health Officer, approved the project, and placed it in the Division of Preventive Medicine, thereby making it possible for the State Board of Health to pioneer in initiating and developing a birth control program in connection with the whole-time City, County, and District Health Departments. Dr. George M. Cooper, Assistant State Health Officer, and the Director of the Division of Preventive Medicine, and Dr. Clarence J. Gamble, a member of the faculty of the Medical School of the University of Pennsylvania, were largely responsible for this progressive step. Quietly and without publicity, plans were devised whereby indigent mothers, overburdened by too frequent pregnancies, and in most cases suffering from disabling diseases, might be given contraceptive advice through their county health officials. For years Dr. Cooper had realized that something definite should be done to control the birth rate among the diseased of the indigent class, and at the same time bring relief and better health to a large group of indigent helpless women whose pleadings for birth control information had long gone unheeded, especially in view of the fact there were no longer federal or state legal restrictions against giving this information.

At the time this program was launched there were two centers already operating in the state—one at Fayetteville, in the eastern section, adjacent to the vast coastal plain; the other in the city of Asheville, in the mountain region.

The state sponsorship of local health department programs had its beginning on February 14, 1937, when the staff of the State Board of Health was informed that Dr. Gamble was willing to finance a program of establishing birth control centers in connection with

* Part I read before the Public Health Nursing Section of the American Public Health Association at the Sixty-eighth Annual Meeting in Pittsburgh, Pa., October 18, 1939.

county health departments. The board accepted this arrangement and approved the plan to employ a special field nurse to work under the direction of the Division of Preventive Medicine in organizing centers and correlating their service with the regular activities of the local health departments. Thus came into being the first birth control program sponsored by any state department of health.

The objectives of this program were threefold:

1. To reduce the high infant death rate and the loss of mothers' lives.
2. To curb the high birth rate among dependent families and create an awareness of the importance of proper spacing of all future children of the state as the prerequisite for healthful and happy family life.
3. To endeavor to increase the birth rate among the physically fit, and the financially and intellectually competent.

A statement of the policies safeguarding these first contraceptive centers and those that were to follow was made by Dr. Cooper in a letter announcing the plan to county health officers.

He said in part:

There is no argument about the necessity for attempting to prevent further births by the woman who has eight or ten children and who is diseased and whose life would be in jeopardy by further childbearing. The problem is to do something about it before that stage is reached. We are interested only in the medical indications upon which practically every physician would be in agreement, that is, in trying to prevent legitimately further births among women who are bad maternal risks, both for themselves and for their babies.

There has been no effort and there will not be any effort to induce any health officer or any medical society to take action, unless the request comes from the health officer himself and his own medical society. Our work, of course, is more largely experimental in order to try to determine the practicability of any plan of this character. The work is strictly for indigent patients who have not and do not now have the advice of private physicians in these matters such as their more fortunate sisters have always had.

I want to repeat that the work is being done in strict accord with medical opinion wherever undertaken and through the specific direction of the local health officer. My purpose in writing this letter is, first, to inform you of this program officially and, second, to express the hope that you will discuss the matter at your convenience with your local physicians and also lend a sympathetic ear to the appeals of the welfare officer at any time that official should appeal to you.

It might be said here that the way had been paved to a great extent for setting up the birth control program of the State Board of Health through an educational program carried on for many years by the North Carolina Conference for Social Service, backed by the State Board of Charities and Public Welfare. Both of these associations adopted resolutions in 1932 favoring birth control work. Another organization which was a more recent outgrowth of the North Carolina Conference for Social Service and which did valuable service in creating public opinion in behalf of a birth control program was the North Carolina Maternal Health League, organized in 1935. All of these organizations did excellent groundwork in educating the state's leading men and women to seek a better medical and health program for indigent mothers.

Something of the sentiment of the people of the state in their support of this program is seen in the resolution adopted by several leading state organizations. The North Carolina Conference for Social Service at its general session in Greensboro on April 25, 1938, the North Carolina Federation of Women's Clubs at a general session in Wilmington on April 29, 1938, and the North Carolina Federation of Business and Professional Women's Clubs at their general session held at Goldsboro on June 16, 1938, adopted the following resolution:

We desire to see birth control centers established in every county in the State for mothers who for economic reasons are de-

pendent upon the Board of Health, and are entitled to have a reliable source where prevenceptive instructions may be obtained; and we commend the State Board of Health, the State Health Officer, the Assistant State Health Officer, and Dr. Clarence J. Gamble for the advanced step taken in sponsoring the progressive and intelligent birth control program through the field of public health.

As the birth control program is now set up and operated in North Carolina, it supplements the state's maternal and child health service. It rounds out a program otherwise incomplete for the distressed mother desiring better health for herself, her family, and future children. Patients are admitted to the centers for a number of reasons—enough children already, child spacing desired, and for any other justifiable medical indication.

In clinic procedure, there is variation and adaptation according to local needs. In some centers patients are referred to hospital clinics, in others to family physicians, private physicians, health department clinics, or they are instructed through home visits by public health nurses. The last plan is employed more generally in the rural districts, and the state is largely rural.

Training for public health nurses in birth control work is based upon the same fundamental principles as of the standard public health nursing program. In general the nurse should have:

1. An understanding of the need for a public health birth control program.
2. Ability to correlate this particular service with other phases of routine clinic and home visits.
3. Judgment in selecting cases and in interpreting their attitudes.
4. Appreciation of the importance of giving careful and definite instructions, and faithfulness in follow-up work.
5. Watchfulness to see that the case load of the general program does not crowd out the prevenceptive program. This is most essential if any enduring service is to be rendered of a definitely established plan.

The short time in which the North Carolina birth control program has been in operation is probably not sufficient to produce accurate statistics. As a matter of fact we consider it still in the experimental stage. However, the growth of the work is seen in the following figures: In March, 1937, at the time the state program was initiated, there were two clinics operating with a total of 84 patients. At the end of the first year after the state program was inaugurated, there were 36 centers operating in 33 counties, which had reached 641 mothers. At the end of the second year, a survey showed there were 62 centers in 60 counties, which had instructed over 2,000 patients. A recent survey indicates there are now 4,000 cases.

Another indication that the general program is getting results is that the vital statistics of the state during the first 6 months of this year compared with the first 6 months of 1938 showed a decrease in both infant and maternal deaths, there being 316 fewer deaths of babies and 45 fewer deaths of mothers. The birth rate from January through June, 1939, was 21.6 as compared with 22.6 in 1938, while the death rate dropped from 10.0 to 9.2. A decrease of 1,255 births and 1,132 deaths is reflected during the first 6 months of 1939 as compared with the same period in 1938.

Arrangements have been made with the Institute for Research at the University of North Carolina to make a careful study of the case records kept by the health departments to determine the effectiveness of the different methods employed and the success of the general program. It is believed that a much longer period of time will be necessary in order to make an authoritative study.

A carefully worked out program of staff education has been a fundamental procedure in developing the state-wide birth control program in the North Carolina State Board of Health.

An Official Declaration of Attitude of the American Public Health Association on Desirable Standard Minimum Functions and Suitable Organization of Health Activities

AT the request of the Executive Board, a report adopted by the Association in 1933 under the above title has been revised for consideration by the Executive Board and the Governing Council at the 69th Annual Meeting in Detroit. This proposed revision, which now carries only the approval of the Committee on Administrative Practice, is published for the information of the membership.

I.

General Considerations

The people of North America have, for the past ten years and more, enjoyed a condition of good health not previously attained for any great population group of diverse races. This is not merely an accident of good fortune, not wholly an unearned asset of favorable climate or geography, nor a result alone of higher living standards than prevail in some other nations of Western civilization.

The consistent continuous use of the medical and associated sciences through civil government is largely responsible for the present high level of health among the people of this continent, their entire freedom from certain pestilential diseases prevalent in former times, and the progressive reduction in the spread of epidemic disease still commonly experienced.

As a result of 75 years of practical experience, the basic principles of official health services are now everywhere recognized as necessary in any community of modern society. These have been accepted generally by the governments of the United States and Canada, and are universally endorsed by the several professions concerned.

The American Public Health Association, believing that the present high state of health of the citizens of the country is in a large measure the result of public interest in personal and public health developed through the work of state and local health departments, and believing further that a sound national health demands the continuation of state and local public health activities on a comprehensive basis, providing at least for the minimum essentials of health protection and promotion, has set down the following fundamental principles of program, administration, and organization, which may be used as a guide to health officers and other interested persons. These essentials as

expressed should be considered as minimum requirements compatible with the preservation and promotion of public health. The conservation of the public health has long been recognized as one of the essential functions of government. The protection and promotion of the health and the welfare of the citizens are conceded by all authorities on political science to be inherent duties of the modern state, although the obligation may be delegated in large part to its political subdivisions.

The American Public Health Association calls upon the appropriate legislative and executive officers of the national, state, and provincial authorities, and upon the rural and urban local governments of this continent to take such action as will secure the continued improvement in the people's health upon which alone permanent security and happiness of life is founded.

II.

Scope and General Policy of Public Health Work

Remarkable advances in the medical sciences have increased the means of controlling disease. To be useful these measures must be practically applied. Some measures for prevention and control are applicable by the action of individuals alone; others will require action by government or by nonofficial organizations.

Great advances in knowledge concerning infectious diseases were made toward the close of the last century and provided the foundation for the application of measures which have prevented or greatly reduced a number of communicable diseases that have long afflicted mankind. Many of these communicable diseases are no longer numbered among the chief causes of death. Meanwhile, knowledge of the causes and of methods of diagnosing, treating, or controlling a number of other important diseases has steadily increased. New knowledge may be expected concerning the disorders of nutrition, diseases of the heart and arteries, cancer, disorders of the mind and personality, and other major causes of disability and death. Application of this knowledge in the interest of the public health will depend upon its practicability and the extent of public support.

Health departments should be responsive to public demand. The scope and policy of public health work at any given time will depend upon the state of medical, sanitary, and related sciences, and upon the readiness of the public to support their effective use. Any formulation of the scope and the general policies of public health work must, therefore, be in terms sufficiently broad to include expansions made possible by developments in these sciences and in public understanding of their social usefulness.

With these considerations in mind, the following general policies may be stated:

1. A health problem becomes one of public concern when, because of its nature and extent, its solution requires organized group action.
2. The responsibility of a community for public health involves procedures that are community-wide in their application (as in the case of sanitary measures) and those intended to conserve the health of individuals who, for any reason, are unable to command health protection at their own expense.
3. Public health service may properly include not only well recognized procedures, such as those of sanitation, vital statistics, the prevention and control of communicable diseases, and health education of individuals, but also:
 a. Needed services, unless otherwise provided, for individuals afflicted with certain conditions and diseases which have a wide preva-

lence, a high cost of treatment, and are amenable to organized effort, such as those already found practicable in the treatment under public auspices of mental disease, tuberculosis, cancer, pneumonia, and syphilis.

b. Such responsibility for other medical care of individuals as may be delegated by legislatively expressed public policy to the health department rather than to some other branch of government.

RESPONSIBILITY IN REGARD TO CARE OF THE SICK

Various forms of tax-supported medical care are in operation for needy persons in many communities by the action of local or state governments. These systems are expanding. Many professional societies and lay organizations are also undertaking plans for the provision of medical care on a prepayment or insurance basis for self-supporting persons of small means.

Included among the obligations of the medical officer of health to the community is that he inform himself as to the facilities for the general care of the sick, their character and distribution, and that he make use of his position to see to it that any important inadequacies are corrected by appropriate action.

We believe that health officers should participate with other governmental and with voluntary bodies, particularly the medical profession, in planning for the improvement, coördination, and extension of medical facilities and services. Diagnostic facilities, treatment, and individual instruction in personal hygiene, through medical conferences and visits by public health nurses, should be provided by health departments for all persons needing such services and not in position to obtain them under conditions which make their general utilization reasonably probable.

HEALTH DEPARTMENT AS A LEADER FOR ALL COMMUNITY HEALTH WORK

It is believed that a comprehensive and well coördinated public health program in any local community or state can exist only when the health department assumes the leadership in public health administration. The health officer is properly held responsible for the performance of such functions as are necessary to secure the maximum of health and longevity of which the people of his community are capable. This does not imply that all services for the protection and promotion of public health must be carried on as official health functions, but rather that the department shall recognize the need of services, participate in the planning, and insure the coördination of activities carried on by other agencies, official and voluntary, in an adequate plan of health service applicable to the entire community.

III.

ESSENTIAL LOCAL PUBLIC HEALTH SERVICES

A modest but adequate health program for the people of North America can be guaranteed if the following basic principles of work are observed.

For all official health organizations operated under federal, state, or local authority, leadership and responsibility should be vested in a full-time trained health officer appointed on professional qualifications and secure against political interference or dismissal during competent performance; he should receive a salary equivalent to the net income of physicians or other professional men of equal training, and commensurate with the public responsibilities placed upon him; he should not engage in any other gainful occupation inconsistent with the proper conduct of his

office and should be required to give his whole time to its duties; annual appropriation for official health work totalling at least $1.00 per capita of population served should be provided for the minimum activities hereafter described, and exclusive of medical care and hospital services; freedom for the health officer to select trained personnel for medical, nursing, sanitary, laboratory, and statistical activities from lists of persons of proved competence should be assured.

There should be in every state (or province) or city, a board of health or public health council serving (preferably without pay), to advise with the health officer and determine the general policies of the health department. The same principle is probably applicable in smaller local units, counties, or rural health districts.

This body should include physicians, members of other appropriate professions, and representatives of the general public.

The state, city, or other local health officer should be directly responsible either to his board of health, or to the chief executive of the governmental area concerned.

With such leadership and resources there should be undertaken a program of local health department activities which will include at least the following six primary functions of modern health departments, which should be directed by full-time trained experts responsible to the health officer, except where the organization is too small to justify such desirable specialization of personnel.

LOCAL HEALTH DEPARTMENT FUNCTIONS

A. *Vital Statistics:*

The collection, tabulation, analysis, interpretation, and publication of reports of births, deaths, and notifiable disease. This, the first public function upon which all competent planning for health protection is based, is no more than the official bookkeeping of the human family within the political or governmental unit.

B. *Sanitation:*

The control of the material environment of man in the interest of human survival, comfort, and use.

The specific responsibilities in this respect include:

1. Safeguarding all water supplies, both public and private, commercial and household, so that the purity of the water for dietary, cleansing, or recreational use may be universal.
2. Securing the sanitary disposal of human and industrial wastes in a manner to avoid nuisance, and prevent the pollution of foods or water supply.
3. Supervision of the production and distribution of milk, and milk products, by licensing, inspection, and laboratory tests, to prevent the sale of any but a clean, wholesome pasteurized milk of standard food value.
4. Supervision of the production, processing, and distribution of foodstuffs, including shellfish, and of drugs and devices offered to the public for treatment of sickness.
5. Supervision of all places of human habitation to secure adequate light, air, water, sanitary necessities, protection from inclemencies of weather, and to prevent overcrowding of occupants. Also control over the environmental sanitation of public camp sites, swimming pools, bathing beaches, parks, and other public properties.
6. Control of mosquitoes, other insects, rats, and other vermin, such as may affect the public health.
7. Control over the environmental conditions of employment.
8. Control over atmospheric pollution by smoke, dust, and harmful fumes.

C. *Control of Communicable Diseases:*

Communicable disease control has always been and continues to be a basic activity of public health service. Health departments will fall in the confidence of the general public if they fail to prevent epidemics of certain communicable diseases. Practical application still lags far behind definite knowledge already attained which would enable physicians, public health authorities, and an enlightened public, working intelligently together, to make much greater progress in the control of many communicable diseases and to eradicate others as public health problems.

Specific responsibilities of the health departments include provision for the reporting of cases, the isolation of patients, and immunization of susceptible persons.

With regard to tuberculosis, syphilis, gonorrhea, malaria, hookworm disease, and epidemic diarrheas, there must be also systematic effort to find cases of infection not yet the subject of official report, and responsibility to provide diagnostic, consultative, and treatment facilities where necessary, and particularly for tuberculosis, x-ray service for diagnosis and review of progress, and sanatorium care.

D. *Laboratory Service:*

A well organized public health laboratory is one of the foundations of effective health work and is indispensable to an increasing degree for a wide variety of correlated public health functions.

Specific responsibilities of health departments include the building up and maintaining of a laboratory service which will provide assistance to practising physicians and departments of health in the diagnosis of communicable disease. Such a laboratory will be an important factor in stimulating friendly relations between physicians and the health department providing an expeditious and reliable diagnostic service. Control of foods and many other features of general sanitation depend for their effectiveness upon the skills and technics of the public health laboratory.

E. *Protection of Health in Maternity, Infancy, and Childhood:*

Beginning in social concern with the health status of the man and woman preparing for marriage, and continuing with supervision over the health of the expectant mother and carrying on with the protection of health of the new-born, the infant, the preschool and school child, and finally supervising the conditions of work and the fitness to work of young people even to the age of 18 years in some states, the health department deals with the important problems of human reproduction, growth, and development. Efficient conduct of services for the safeguarding of the health of mothers and young children materially reduces the burden of activities intended to control tuberculosis, syphilis, and other communicable diseases.

Whether school health service is provided by the department of health or by the educational authorities of the community, there should be formal provision for collaboration between these two departments of civil government to avoid duplication of services and conflict of authority.

F. *Public Health Education:*

Modern public health practice has shown how to prevent a large proportion of sickness and premature deaths. It is a responsibility of health departments to make this knowledge accessible to the average man, in a form that he can understand and make a part of his living. This may be accomplished through such channels as general newspaper or magazine publicity and per-

sonal effort with individuals by public health nurses and other professional and lay staffs, the distribution and publication of books and pamphlets dealing with subjects of personal and community health, through lectures, personal and group demonstrations, using lay and professional staffs, through pictures and exhibitions, the film, and the radio.

Many fields of preventive medicine can be cultivated, and effective progress made, chiefly or only after the public concerned have learned what they themselves can and must do in their own interest and through the services of the physician of their choice or through community agencies. Such campaigns of education as have been effective against tuberculosis, diphtheria, and syphilis, where official control is of great importance, have their counterparts in efforts to teach the people all of the facts they can understand about cancer, diabetes, heart diseases, nutritional diseases, occupational diseases, some diseases of mentality or personality, and especially about the care of the expectant mother and of young children. The public should understand both the extent of effectiveness and the limitations of modern medical, sanitary, and related science.

PUBLIC HEALTH NURSING

Throughout the work of the department of health in communicable disease control, in maternity and child hygiene, in public health education, and, in many rural areas, also much of the work for sanitation, depends for its effectiveness upon the services of public health nurses professionally directed.

Public health nurses, qualified to meet the standards of their profession, contribute materially to the work of each division in which they are engaged. In communicable disease control and in giving advice about food, rest, and health of children, their services are effective and are welcomed. They interpret the directions of the family physicians and of the physician of the health department. Their organizing ability for community projects and coöperation can be relied upon.

RESEARCH

Maintenance of essential health services at a high level, and assurance of improvement in the critical analysis of all that is done in the public interest require that some of the time and attention of the personnel of each major division or activity of every health department be devoted to inquiry and research so that the health department will be a source of new and accurate knowledge of preventive medicine and public health practice as well as the agency through which long established facts of science are made practically effective.

RELATION OF PRIVATE PHYSICIANS TO PUBLIC HEALTH

The employment of a competent family physician to guide the household in health as in sickness is the best investment the private individual can make for health. Physicians in private practice are the major reliance of our people in the care of disease, and can be of essential service to their patients in applying the principles of preventive medicine to personal service. The public should be encouraged to demand and pay for preventive service from their private physicians.

Health departments should include in their educational programs efforts to develop a demand for preventive services rendered by private physicians. Participation by all private physicians in procedures of a personal and clinical nature recommended by the health department is indispensable in the interest of the health of the community.

Health departments should also be prepared to accept responsibility for

planning or for supplying needed preventive services for persons who are not able to pay for them on an individual basis.

In deciding whether a given health procedure should be conducted by the department of health directly or by individual medical practitioners or other agencies, the primary consideration should be the welfare of the community. Relative cost, relative efficiency, and the practicability of adequate supervision must be considered. Where these factors are reasonably equal, preference should be given to a program which decentralizes health procedures so as to enlist the private practitioner in their application.

IV.

STATE AND NATIONAL HEALTH SERVICES

Complementary to the proper activities of local health departments are the health functions of state and national government.

State health functions include at least the following:

1. Coördination and technical supervision of local health activities.
2. Financial aid to local health departments as required.
3. Establishment and enforcement of minimum standards of performance of work of health departments, particularly in respect to communities receiving state aid for public health.
4. Enactment of regulations dealing with sanitation, disease control, and public health, which have the force of law throughout the state.
5. Collection, tabulation, and publication of vital statistics for each important political or health administrative unit of the state and for the state as a whole.
6. Collection and distribution of information concerning preventable diseases throughout the state.
7. Maintenance of safe quality of water supplies and controlling the character of the disposal of human waste for all communities of the state.
8. Establishment and enforcement of minimum sanitary standards for milk supplies.
9. Prescription of qualifications for certain public health personnel.
10. Maintenance of a central, and where necessary branch, laboratories for the standard functions of diagnostic, sanitary, and chemical examinations; production of therapeutic and prophylactic preparations, and their free distribution for public health purposes; establishment of standards for the conduct of diagnostic laboratories throughout the state; laboratory research in the causes and means of control of preventable diseases.

National, as distinct from state and local, health functions include at least the following:

1. Study of national health problems and planning of their solution as may be necessary on a national scale.
2. Meeting obligations under international treaties.
3. Control of communicable diseases in international and interstate commerce.
4. Administration of medical and health services on national property and for certain classes of federal employees.
5. Discovery of the causes and means of control of disease through organized research.
6. Sanitary control of interstate traffic and common carriers.
7. Control of foods and drugs in interstate commerce.
8. Assistance to states, and through the states to local areas, in the extension or improvement of their health services. This assistance may

be either technical or financial, or both, as circumstances may require.

9. Central collection, tabulation, and publication of vital statistics of the various component political units (states or provinces, cities and rural areas).
10. Establishment of standards of control of manufacture and sale of biological products used in the treatment of disease.

RELATIONS OF STATE AND LOCAL SERVICE

The Association believes that local authorities should assume the primary responsibility for carrying out the program here recommended since the major part of direct service to people can be most efficiently and economically rendered on a community basis. A permanent, efficient, and economic solution of health administration on a state-wide basis can come only through the organization of local (city, county, or district) health departments serving communities of sufficient size to make possible the employment of competent, technically trained executives who are responsible for the development of a sound comprehensive program, and who devote their whole time and energies to public health work. Such a department should include the medical, nursing, engineering, laboratory, inspectorial, and clerical personnel necessary to carry on a complete program.

STATE AID FOR LOCAL HEALTH SERVICES

Public health is a primary responsibility of each local community, but it is indispensable that there be authority vested in the state department of health to assure people of all communities that the health in some of them will not be jeopardized by the inertia, incompetence, or neglect of local government in others.

Furthermore, public health problems are usually more than local and there is wide divergence in the ability of local communities to meet the cost of adequate health programs, and, since in certain fields there is need of the assistance and guidance from highly trained staffs, the Association believes that the development of adequate public health services throughout the country depends upon state health departments being equipped to stimulate and advise regarding local health work and to give a substantial amount of direct financial aid when necessary to such work.

NATIONAL AID TO THE STATES AND LOCALITIES

Wide divergence exists among the states as well as within the states in economic resources and in available medical facilities. These and other reasons form the basis for the recently adopted policies of financial and professional aid to the states from the federal government for organizing and maintaining public health services where needed, and for assistance in the education of professional personnel. Health services under state laws and local ordinances should maintain, as they do at present, the principle of the primary state and local responsibility for administration.

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MEDICAL PREPAREDNESS

THE session of the American Medical Association, held June 10–14, in New York, was notable in many ways. It was certainly the largest gathering of physicians by some 2,500 that the Association has ever attracted. There was an unusual unanimity and singleness of purpose manifested throughout but overshadowing was the war in Europe, its consequences to us in this country, and the possibility of our becoming involved, to an extent which made everyone feel the necessity of marshalling the medical forces for a program of preparedness.

Not only did the meeting speak for the doctors of the country in a promise to serve under the government if occasion arose, but a resolution on Medical Preparedness was submitted for the Board of Trustees, passed unanimously, and a committee appointed. This resolution properly recognized that only the medical profession could select men physically fit for service in the military, naval, aviation, and veteran administrations, and that the rehabilitation of those not physically fit could be carried out only by the medical profession. In addition, the necessity of the services of the medical profession, for industrial workers, medical care of the civilian population, and the education of young men for the medical profession was emphasized. Further, attention was called to the vast amount of information held in the offices of the American Medical Association, such as complete records of all qualified physicians in the country, information concerning facilities for medical education, the hospitals of the United States, and the machinery for making contacts with doctors and medical agencies throughout the country.

Since the American Medical Association is the only organization which has all of this material at hand, the Board of Trustees was authorized to create a Committee on Medical Preparedness consisting of 5 officers of the Association ex officio, and 10 members of the House of Delegates. This committee was authorized and instructed to " establish and maintain contact and suitable relationship with all governmental agencies concerned with the prevention of disease and the care of the sick, in both civil and military aspects, so as to make available at the earliest possible moment every facility that the American Medical Association can offer for the health and safety of the American people and the maintenance of American democracy."

In addition to this, the *Journal of the American Medical Association* established a new Section on Medical Preparedness, wherein the activities of this committee will be noted and official announcements from the various departments of the government will be published.

Another significant movement was the presentation by Colonel C. G. Dunham of a tentative plan for building up the personnel of the Medical Corps of the Army in the event of an emergency. According to this the American Medical Association was to conduct a survey of the medical profession, covering the entire country, utilizing the local and county societies. The state societies were to maintain an available roster of their members and the American Medical Association was to maintain a numerical roster of availability by states. One or more medical officers of the Army were to be on duty at the headquarters of the American Medical Association in Chicago, and the War Department, corps areas or regional officers were to call on the American Medical Association for medical men as required. There were features with which the Reference Committee of the Association could not agree, though they endorsed the principles advanced. In general it was felt that in the choice of personnel for special services each physician capable of rendering service be allowed to offer himself to the government, and that there should be no arbitrary selection as advocated, but that membership in well recognized scientific specialty organizations, hospital appointments, and similar qualifications should also be considered.

At the beginning of the World War the regular Medical Corps of the Army numbered only a few hundred, something like 33,000 doctors throughout the country volunteered, while some 30,000 saw active duty, and there is no doubt that in any similar emergency the medical men of the country can be counted upon again to offer their services promptly and freely. There can, however, be no question of the importance of preparation and proper organization, as during the World War there were many inequalities, injustices, and misfits.

No one doubts that the public health personnel of the country not included in the medical profession will volunteer as promptly and freely as they and medical men did in the World War, and will do in any possible emergency. For them also, however, preparedness and organization are as necessary as for the doctors. A pronouncement on the matter can be confidently expected in the near future.

THE GOVERNMENT AND MENTAL HYGIENE

IN 1938, in the Report of the Surgeon General of the Public Health Service, attention was called to the increasing importance of mental and nervous diseases and epilepsy, and to the fact that while millions of dollars were spent annually for the care and treatment of such patients, there was being done very little fundamental research which might possibly assist in dealing with the problem by increasing the effectiveness of measures for prevention and cure. At that time the establishment of an institute for the study of nervous and malignant diseases was recommended.

In the 1939 Annual Report the idea is taken up again and after a study of existing facilities and the problems to be solved, it is suggested that an institute with 250,000 cubic feet of laboratory space for fundamental research be provided, together with access to 200 patients for clinical and laboratory work.

It is proposed by the Surgeon General to establish a National Neuropsy-

chiatric Institute modeled on the plan of the National Cancer Institute. Attention is called to the fact that hospitals for mental diseases have on their books more than 500,000 patients and, in addition to this, there are 117,000 patients in hospitals for mental defectives and epileptics. Owing to the increase in life expectancy there will be a corresponding increase in the total number of mental disease cases in the older groups as the incidence in the age group over 65 years is ten times that of the group 19 years and under, and for this reason provisions against this should be made as soon as possible.

Recent developments have shown the influence of certain vitamins in relieving cases of insanity which have not heretofore been recognized as being of dietary origin, and this opens a new field of research with very inviting possibilities. Psychiatrists are inclined to believe that constitutional and metabolic factors may play a rôle in certain types of insanity which up to this time have been believed to be of psychic origin. Insulin shock treatment has come into use in one form of mental disease and there are many indications pointing to the importance of physiological research in respect to mental and nervous disorders.

It is proposed to build the Neuropsychiatric Institute on the present site of the New York Marine Hospital which would have the advantage of giving the staff access to patients and library facilities in the City of New York. In addition to this, it is suggested that there should be funds available for allotment to competent groups in different parts of the country for research on the problems of nervous and mental diseases and epilepsy. A National Advisory Council similar to that provided for Cancer is also recommended.

REFERENCE

1. A National Neuropsychiatric Institute, *Science* Supplement, Vol. 91, Jan. 12, 1940, p. 8.

THE INJECTION OF BIOLOGICAL PREPARATIONS

THE use of biological preparations, especially when introduced with a hypodermic syringe, carries with it many responsibilities and always a certain amount of danger. Pasteur's saying that a pinprick may open the door to death is still true. In addition to the procedure, the material itself, either through faulty preparation or poor handling, may carry with it infection. However, in spite of the millions of injections of many preparations given by all sorts and kinds of doctors who are supposed to have had proper training, in addition to all sorts and kinds of people without any training, accidents have been very few.

The most recent involves a case which is " probably unique in the medicolegal sense as well as scientifically." Briefly, a number of children after immunization against diphtheria with toxoid-antitoxin floccules (T.A.F.) became infected with tuberculosis, and the question arose as to whether it was due to an error in manufacture, substitution, accidental contamination of the material, improper handling, or other sources.[1] We have only now come into possession of the results of the studies made in clearing up the matter,[2] carried out by two well known professors, one in Ireland, where the accident happened, and one in England, with the senior bacteriologist of the laboratories which prepared the T.A.F.

Among the possibilities considered were: (1) accidental contamination during the preparation of the T.A.F.; (2) accidental substitution of living tubercle bacilli for the T.A.F.; (3) the contamination of the material at the time of injection through poor sterilization of syringes and needles, infection subsequent

to sterilization, and infection derived from the person inoculated. In this country all of our biologicals are issued under license from the National Institute of Health, the manufacturing laboratories are regularly inspected and constantly checked so that we have come to feel that all preparations issued under governmental authority are safe to use.

The English studies brought out some points often overlooked by the average physician and even by the average teacher of bacteriology, and carry suggestions for precautions not usually taken.

It was found that when 0.5 per cent of carbolic acid is used as a preservative, tubercle bacilli are killed in less than 7 days, and all pyogenic organisms in less than 24 hours, so even massive infection is guarded against by the time which usually elapses between preparation and use.

The syringes and needles are of great importance and are usually sterilized either by heat alone in the autoclave or by boiling in 0.5 per cent carbolic acid, for example. It is advised as an additional precaution that special syringes should be reserved for fluids which are bacteriologically "clean." Even drawing boiling oil into the barrel of the syringe does not kill spores. Alcohol with ether or ether alone, though widely depended upon, are poor disinfectants, and cannot be trusted to sterilize during the short time of action usually allowed. Where the syringe is used for multiple purposes and has contained an exudate or any such material high in protein, alcohol coagulates and perhaps sterilizes the surface, but protects microörganisms below the surface. It was concluded that the carrying of syringes or needles in containers of alcohol or ether is definitely unsafe even when separate syringes are used for inoculation and aspiration. In a few instances deaths from tetanus and gas gangrene have followed injections, but they are rare when compared to the many millions of injections given all over the world. During an investigation into deaths from the *Clostridium welchii*, living spores have been demonstrated in alcohol in which the syringes were stored.

Both syringes and needles may become contaminated by contact with hands, dressings, towels, or clothing, but there are two other methods generally overlooked; (1) droplet infection from the nose or throat; and (2) through improperly sterilized rubber caps.

We have for many years recognized the danger of droplet infection, especially in acute respiratory diseases, but the fact that syringes may be so infected has escaped notice of most of us. In 1938, Allison reported an instance in which of 70 nurses inoculated, 12 developed abscesses, all due to the same type of hemolytic streptococcus which was also isolated from the throat of the nurse who had charge of the boiled water which contained the needles and the syringes, the belief being that she infected the contents of the bowl by droplet infection. However, these studies showed that, when a droplet containing tubercle bacilli, not visible at a distance of 2 feet, was placed on the outer surface of the needle near the point and then inserted through a sterilized cap, the entire bottle became contaminated. Of 25 guinea pigs inoculated with this material, 5 died of intercurrent disease but the remaining 20 all showed extensive lesions of tuberculosis. Every cubic centimeter of the fluid in this bottle contained sufficient tubercle bacilli to cause progressive tuberculosis in guinea pigs. It was shown also that, where two or more syringes and needles were used for each bottle, only the first needle having been infected and the syringes being certainly sterile, a single dirty needle could contaminate the entire contents of a bottle.

The widely used rubber cap waxed by dipping into melted paraffin at 126–130° C. is not invariably sterile, though in all the tests made, the ordinary contaminating organisms were dead within 7–12 days. It is often assumed and has been stated that slight contamination on the outside of a needle could be wiped off through passage into the rubber cap. This was definitely shown to be incorrect.

The doctor's bag not infrequently holds a collection of bottles containing samples of feces or sputum, dressings, biological products, etc. Leakage and possible seepage must be held in mind as the conditions produced closely corresponded with those carried out in these experiments.

The work of this notable group left one valuable suggestion for the assurance of complete sterilization, a method which has been routine practice in the hospital with which one investigator (J.W.B.) is connected. Batches of dressings are placed in a drum in the center of which is a test tube containing a dry mixture of fine manured garden soil and hay dust, holding both aerobic and anaerobic organisms. When the autoclave is opened, broth is added to this tube and incubated. Only when no growth occurs are the contents of all drums sterilized during the same exposure, released for use. A further suggestion is that the hospital autoclave should be under the regular supervision of the hospital bacteriologist.

The whole matter is of great importance not only on account of the accidents which are distressing to families and cause great anxiety and even loss of standing to the physicians in charge, but also because they are magnified by those who oppose scientific medicine as well as by the lay press, and so hamper progress.

REFERENCES

1. *Brit. M. J.*, Mar., 1939, p. 480.
2. Bigger, J. W., Blacklock, J. W. S., and Parish, H. J. Investigations and Observations on Inoculation Technique. *Brit. M. J.*, Jan. 20, 1940, p. 79.

IS ONE GRADE OF MILK DESIRABLE?

GRADING of milk has been a successful sanitary procedure in this country for nearly half a century. The system began in 1893, when certified milk was originated as a much needed milk supply of superior hygienic quality. After 1911, when grading of all market milk was enforced in New York City, this method became more or less universal in our larger cities, and since the widespread adoption of the Standard Milk Ordinance of the United States Public Health Service, it has been put into effect in a large number of the smaller cities and rural communities.

There is no question that grading has been one of the important factors in helping to improve our market milk supplies. The higher grades, such as certified milk and Grade A pasteurized milk, have set the pace for all milk supplies, while the bonuses paid by milk companies for the superior grades have been an incentive to dairymen to produce constantly better milk.

Modern milk supplies in metropolitan areas have attained such a generally high quality that the question has been raised as to whether grading of milk in many of these communities may not now be outmoded. A considerable number of cities have provided legally, in fact, for only one grade of pasteurized market milk, although usually permitting the sale of raw or pasteurized certified milk. It is, of course, a fundamental sanitary principle that *all* milk should be properly pasteurized.

Of special interest is the recent action of the Board of Health of New York

City in adopting regulations for a single grade of general market milk, especially since this city was the pioneer in the establishment of the grading system. Effective on September 1, 1940, the former Grade A and Grade B pasteurized milks are superseded by one grade of pasteurized milk to be designated as "Approved." Certified milk, which accounts for somewhat less than one per cent of the total milk supply, may still be sold as such.

Standards for this new grade of milk are higher than those of the former Grade B, which comprised about 87 per cent of the total milk supply, but are lower than those of the former Grade A, which was purchased by some 12 per cent of the local citizens. Thus the bacteriological requirements for the new milk supply are 150,000 per cc. if pasteurized in the country and 400,000 per cc. if pasteurized in the city, in contrast to 100,000 per cc. and 200,000 per cc., respectively, for Grade A. After pasteurization, the standard is the same, 30,000 bacteria per cc. The cooling temperature for the "Approved" milk is 60°F, as against 50°F for the former Grade A, and the age limit for the sale of the new grade is 48 hours, instead of the 36 hours for Grade A. After September 1 all milk must be protected with the cover cap, formerly used only for all Grade A and for Vitamin D milk of the B grade. The minimum butter fat is set at 3.3 per cent.

Whether the new regulations for milk in New York City are an improvement or not is a matter that has aroused much controversy. Despite the somewhat intemperate remarks on the subject by politically-minded bureaucrats, there seems to be no question that Grade A milk was, in general, better than Grade B, although the margin of superiority was not as great as the milk companies were often wont to claim. On the other hand, standards for the bulk of the milk supply have been raised, so that the majority should get better milk than in the past. Persons who want an even better milk apparently will have to buy certified, unless permission is granted for the sale of higher quality milks under special labels. There is no valid reason why such authority, properly safeguarded, should not be granted.

If it seems expedient to adopt a single grade of milk in a community, a wise principle might be to adopt with it the highest standards for milk that have been previously enforced, rather than intermediate standards.

J. G. FITZGERALD, M.D.

IN the death of Dr. FitzGerald, on June 20, 1940, in his fifty-eighth year Canada lost one of its eminent citizens and also an international figure in the field of preventive medicine.

After graduation from the University of Toronto in 1903, Dr. FitzGerald studied in the United States at Harvard University and at the Institut Pasteur in Paris and Brussels. He was appointed Associate Professor of Hygiene at the University of Toronto in 1913. To the University authorities he outlined his plan for research in hygiene and preventive medicine and for the preparation of sera and vaccines of proven value for use in Canada. He initiated the production of diphtheria antitoxin at his own expense. On May 1, 1914, his Antitoxin Laboratory became an officially recognized organization within the Department of Hygiene and Preventive Medicine of the Faculty of Medicine of the University. He was appointed director. From this modest beginning the Connaught Labo-

ratories came into being. Through the plans he laid, this institution has remained unique in that within the provincial university and under the control of a special committee of the Board of Governors facilities for research in preventive medicine in its broad sense are afforded and supported through the production of biological products.

Immediately upon the outbreak of war in 1914 the laboratories were able to meet the urgent needs of the Canadian and Imperial armies. Dr. FitzGerald served as major in command of a mobile laboratory in France and later as assistant adviser to the Fifth British Army. On his return he became Professor of Hygiene and Preventive Medicine at the University of Toronto. In 1922 he served as Professor of Bacteriology and Experimental Pathology at the University of California. In 1924 plans were completed for the establishment of a School of Hygiene in the University of Toronto to serve primarily as a center for teaching of postgraduate students. Through the generosity of the Rockefeller Foundation, funds for the erection of the school were provided. In the new building certain sections of the Connaught Laboratories were accommodated, and Dr. FitzGerald became Director of the school, at the same time continuing as Director of the Connaught Laboratories and as head of the Department of Hygiene and Preventive Medicine, Faculty of Medicine. He was appointed dean of the Faculty in 1932 and held this office for four years.

Dr. FitzGerald's ability and judgment were soon recognized and applied to international affairs. In 1923 he was appointed a member of the International Health Division of the Rockefeller Foundation, and continued in this position until 1931, when he was named as a Scientific Director of the International Health Division, and served for two terms of 3 years. In 1927 he represented Canada at the International Rabies Conference in Paris. He served as a member of the Health Committee of the League of Nations from 1930 to 1936, being vice-president in 1933. He was appointed a member of the Permanent Commission on Biological Standardization of the Health Organization in 1933. In 1933 he made a survey of health conditions in India, Ceylon, and Egypt in association with General F. F. Russell and Sir W. Jameson. He was invited in 1935, by the Rockefeller Foundation, to make a survey of the teaching of that subject to medical undergraduates. With Dr. C. E. Smith of Stanford University, he visited the leading medical centers in Canada, the United States, Great Britain and Ireland, and continental Europe, and made a comprehensive report.

To few are given the qualities of executive ability, singleness of purpose, imagination and vision, coupled with gentleness, modesty and charm of character in such large measure as Dr. FitzGerald possessed. He became a member of the A.P.H.A. in 1912, and a Fellow in 1924.

Credit Lines

A Selective Digest of Diversified Health Interests

D. B. ARMSTRONG, M.D., AND JOHN LENTZ, M.S.

On Taking Over

THOSE who knew the late Evart G. Routzahn intimately, as well as those who knew him only through the pages of this *Journal,* must realize the sense of responsibility that befalls the new editors on taking over this section. During the many years that Mr. Routzahn conducted this section he succeeded in giving it the unmistakable imprint of his warm personality as well as his characteristic prose style. This gained for him a wide and interested circle of readers. The new editors realize that those who may continue to follow these columns will hope to find the original flavor of the section preserved. Mr. Routzahn's particular knack for presenting health education in such a succinct and breezy fashion will be difficult to duplicate, but his characteristic "touch," even if inimitable, will be our inspiration.

As announced in the editorial columns of the August issue of the *Journal,* while this section henceforth will not be limited to comments pertaining to health education, yet readers may expect to find these interests holding sway over other items. Naturally we wish to serve Mr. Routzahn's readers and we venture to hope that others will find the broadened scope of this section useful to them. We shall welcome comments and criticism. Write us about any interesting projects that your department undertakes. Send us copies of pamphlets, posters, or other health education material that you may develop. Let us know what you would like this section to reflect. Tell us how we may present health information so that it may prove most helpful to you. It is by no means an easy task to telescope into a few pages the great volume of material that constantly flows from so many sources. Hence we look to you for a helping hand.

Evart G. Routzahn was a diligent pioneer in the field of health education and his comments in this *Journal* were a guiding influence for many workers in this profession. To carry on this section in much the same manner as it appeared under his editorship is one of the aims of the new editors of "Credit Lines."

A.M.A EXHIBITS

The Scientific Exhibit, an annual feature of the conventions of the American Medical Association, was viewed by thousands of physicians and representatives of related professions during the recent meeting in New York City. No one who witnessed the 1940 array of exhibits could fail to be impressed by the fact that it constituted a remarkable demonstration of the amount and variety of research and of professional education that are being undertaken under all kinds of medical auspices today. The exhibit particularly reflected the serious and exhaustive

inquiries into the mysteries of medicine that are being made by private practitioners and by voluntary groups of medical men. It emphasized the great effort to enhance precision and utility as regards diagnosis and treatment in the many fields of specialization. The keen study given the exhibits by the thousands of professional visitors was another most encouraging sign.

Critics of medicine have classified it as a sordid trade or a moribund science —characterizations with which all would disagree who had the privilege of seeing the manifest growth, vitality, and scientific integrity evidenced by the Scientific Exhibit at the 1940 and previous conventions of the American Medical Association. The threats of litigation and regimentation in medicine are unimportant and transient when measured against the long-time and far-reaching significance of this demonstration of medicine's perpetual search for truth in its service to mankind.

SOME THOUGHTS ON POSTERS

A poster designer recently gave a "shop talk" on his specialty in which some fresh and original comments were made. Health educators might find it useful to remember his definition of a poster. A poster, according to this authority, is an advertisement that exploits a complete situation with true sincerity in a split second—it is a one act play for presentation to a five second audience.

It seems to us that the experts in this line of publicity have "turned the trick" chiefly because they have succeeded in making long stories short. That is to say, they generally use no more than half a dozen words to tell a story or convey a message. Accompanying the brief text one generally notes a highly appropriate type of illustration. Throughout the poster there is an effective use of color both in the illustration and the lettering. Result: posters that are powerful eye catchers . . . posters which, if looked at only for a fleeting moment, tell a complete story.

The authority in his "shop talk" also emphasized the fact that the text to be used on a poster should be boiled down to a minimum, as the general public prefers to get its information in capsule form. At the same time, however, the poster must be made so attractive and entertaining that it will trap attention for a brief interval and release it with a concrete impression of what the sponsor wants to put over. Other points to remember in connection with poster design were discussed and the following may be helpful in connection with the planning of health posters:

1. Refrain from the use of blatant colors—do not try to rival the red, white, and blue "splash" of the circus poster.
2. Use restraint and good taste, and, above all, simplicity.
3. Do not clutter up the poster with a hodgepodge of ideas and illustrations.

Incidentally: the American Society for the Control of Cancer is now sponsoring a contest for a series of posters to be used in the Society's educational program throughout the country. It will be interesting to note whether or not the prize winning posters embody the principles of modern poster design. If any of our readers are interested in this contest, they may secure further information by writing to the American Society for the Control of Cancer, 350 Madison Avenue, New York, N. Y. The contest closes October 12.

A HEALTH EDUCATION LIBRARY

The July issue of the *Bulletin of the National Tuberculosis Association* lists 5 books on health education which are so replete with information that the *Bulletin* asserts that answers can be found to "most of the questions that anyone can ask as to the 'how' and 'what' of health education."

Here are the books that are recommended:

Principles of Health Education, by C. E. Turner, Dr.P.H., Professor of Biology and Public Health, Massachusetts Institute of Technology. 2nd ed. Published by D. C. Heath and Company, Boston.

Community Health Organization, edited by Ira V. Hiscock, Sc.D., Professor of Public Health, Yale University School of Medicine. 3rd ed. Published by the Commonwealth Fund, New York.

Ways to Community Health Education, by Ira V. Hiscock, Sc.D., in collaboration with Mary P. Connolly, Detroit Department of Health; Marjorie Delavan, Michigan Department of Health; Raymond S. Patterson, Ph.D., John Hancock Life Insurance Company; and William H. F. Warten, M.D., Baltimore Department of Health. 3rd ed. Published by the Commonwealth Fund, New York.

Your Community, Its Provision for Health, Education, Safety and Welfare, by Joanna C. Colcord, Director, Charity Organization Department, Russell Sage Foundation. Published by Russell Sage Foundation, New York.

Education for Health, A Study of Programs for Adults, by Frank Ernest Hill. Published by the American Association for Adult Education.

An up-to-date library is almost indispensable to the health educator, since the scope of his work is constantly being broadened. It is essential for workers in this specialty to have access to the latest literature in the field. How many of these books are in your library?

MAGAZINE ARTICLES

Readers of this section will recall that under Mr. Routzahn's editorship articles from current popular magazines on health or of medical import were listed each month. Many health educators undoubtedly found this a helpful feature, and "Credit Lines" will continue to list this material. Sometimes these articles may lack the degree of precision and accuracy that is desired in all health information, but the manner of presentation is generally lively and stimulating. Moreover, the style reflects some of the best talent in the journalistic field now devoted to popular expositions of scientific topics. It would be wise for health educators to read and evaluate these articles, for sooner or later someone will probably ask: "Did you see such and such an article in *Collier's?* or *Life?* or *Time?* or the *Saturday Evening Post?* What did you think of it? Is it true what this or that article said about the new five day treatment for syphilis?" and so on.

Much of the appeal of these popular articles, aside from the reader interest, is found in the attractive illustrations that accompany the text.

The following magazine articles, although not necessarily recommended, and not presented as a complete list, are worthy of your attention:

"T.B." Helena Huntington Smith. *McCall's,* New York, N. Y. May, 1940.

"Black Magic and Men in White." R. C. Gill. *Saturday Evening Post,* Philadelphia, Pa. June 29, 1940.

"Vitamins Are an Industry." *Printer's Ink Monthly,* New York, N. Y. May, 1940.

"To Test a Baby." Avis Carlson. *Atlantic Monthly,* Boston, Mass. June, 1940.

"Films in Public Health." Alice V. Keliher. *Business Screen,* Chicago, Ill. Vol. 2, No. 6.

"Give the Patient a Break." Hugh Cabot. *American Magazine,* New York, N. Y. April, 1940.

"Allergy Is Where You Find It." Harry F. Swartz. *The American Mercury,* New York, N. Y. July, 1940.

"20th Century Conquerors of Disease" (in two parts). Dr. Edward F. Roberts. June and July, 1940, issues of the *Rockefeller Center Magazine.*

"Lifting the Shadow of Syphilis." Surgeon General Thomas Parran. *Scribner's Commentator,* New York, N. Y. August, 1940.

"We Are What We Eat." Victor Heiser. *Better Homes and Gardens,* Des Moines, Iowa. August, 1940.

"Dr. Will and Dr. Charlie." Edward M. Brecher. *Scribner's Commentator,* New York, N. Y. July, 1940.

As articles of this type appear each month, it might be worth while to discuss them at staff meetings. Inaccurate articles or articles containing misleading statements should be singled out for

criticism by writing to the publisher or editor of the magazine concerned. Vigorous protest might lead to better scientific reporting. On the other hand, if articles appear that are well authenticated the editor or publisher of the magazine concerned should be commended. This would encourage publishers to print additional health or medical articles in their journals.

A NEW JOURNAL MAKES ITS BOW

Volume I, Number 1 of the *Quarterly Bulletin of Studies on Alcohol* made its appearance in June. This is the official publication of the Research Council on Problems of Alcohol, an organization which is now undertaking a research program to ascertain the facts about alcoholism and to make these facts known to the public.

The first issue of this new journal contains several noteworthy studies pertaining to the alcoholic psychoses and other aspects of alcoholism. The articles were contributed by distinguished scientists and their studies are presented in an interesting and scholarly manner.

Well worth reading in the first issue of this journal is an article by Dr. Abraham Myerson, entitled "Alcohol: A Study of Social Ambivalence." Here are some of Dr. Myerson's observations: "The problem of alcoholism is a serious one. No drug addiction that we know of is as important in western civilization. The amount of social damage done by alcoholism is enormous and if drinking is used as a way of escape, it is a futile one and overcostly. But even these facts, however widely they may be spread and to what extent they may be elaborated statistically, do not alter the fact that alcoholic beverages serve useful functions in society and that the moderate drinker shows no inferiority in any respect whatever to the total abstainer and in general he is probably a more personable fellow, easier to get along with, and having a better time out of life."

Continuing, Dr. Myerson says: "Alcohol is a sort of chemotherapy for undue stress, for the overdeveloped purpose, for the effect of those social organizing forces which often become too onerous. It releases exuberance, good fellowship, and friendliness, all of which are exceedingly valuable to man. The synthesis of temperance, of the wise use of alcoholic beverages, is a necessary part of the battle against alcoholism."

Dr. Myerson also points out that there must be no lessening of social control of the use of alcohol. The main road to the prevention of alcoholism is a personal temperate attitude that can be brought about by the development of a new and wise social tradition which may appropriately be labeled "enlightened hedonism," according to this authority.

A PHYSIOLOGIST LOOKS AT HEALTH EDUCATION

Dr. Anton J. Carlson, physiologist at the University of Chicago, makes many interesting observations on health education in an article which appeared in the January, 1940, issue of *The Scientific Monthly*.

Here are some of Dr. Carlson's thoughts on the subject:

> We are slowly realizing that at all stages of education the traditional "three R's" must be rounded out with an "h," which stands for, not hallelujah, but *Health*. And health education is more than the establishment of so-called health habits, like love for the toothbrush, fear and hatred for gin and whiskey. Education is more than habit formation, more than cerebral canalization to the centers for love and hate. Education means understanding. Health education means *understanding the living body*, the living machinery of man, the known causes of disease or ill health, and the known ways of keeping fit. This is the contribution of the medical sciences to primary and general

education in our democracy, as yet only partially either sensed or achieved. The imparting of the traditional three R's to youth is by the nature of the case largely a matter of dogma and drill. But drill and dogma are largely futile in health education. Health education cannot be achieved by the memory route, as can the alphabet, the multiplication table, or the church catechism. Health education involves the ABC's of science and the scientific method, both on the part of the teacher and the pupil, that is, controlled experimentation, rechecked observation, repeatedly verified cause and effect relations. It is the development of the skill in finding "facts," the use of reason based on facts rather than an exercise of faith based on unverified dogma.

TIME WILL TELL

Interesting predictions about the control of three important public health problems were recently made by R. A. Vonderlehr, M.D., Assistant Surgeon General of the U. S. Public Health Service, and Louis I. Dublin, Ph.D., Statistician of the Metropolitan Life Insurance Company.

In an interview Dr. Vonderlehr stated that he foresaw the control of syphilis within 25 years, provided that the existing federal services are maintained. He added that if the new five day treatment proves effective syphilis may yield to control in a shorter period—perhaps within 10 years. Dr. Vonderlehr also ventured to predict that gonorrhea will be stamped out in the United States in 5 years. He based his optimistic prediction upon the successful treatment of gonorrhea by means of new chemotherapeutic agents.

At the recent conference of the National Tuberculosis Association, Dr. Dublin forecast that tuberculosis could be "substantially eradicated" in this country by 1960.

Time will tell. Certainly it is interesting to have this "preview" of what the disease situation may be in the years that lie ahead.

RADIO TABOOS

Has public response to your radio programs been disappointing? Possibly you may be frightening many listeners away simply because your program happens to be listed as an educational program or a health lecture. According to the *New York Times*, new terms must be coined to supplant "education" and "lecture" for broadcasting purposes, as both words connote something dull or cut-and-dried to the mass of radio listeners. The educational programs produced by the National Broadcasting Company are called "public service presentations," while in England the term "popular talk" has taken the place of the word "lecture." Moreover, the *Times* maintains that the educational program must be "sugar-coated with music, drama, and showmanship if it is to become a tasty morsel for the ear."

Hints and Hunches

Educational Qualifications in Public Health—The educational qualifications recommended for health officers by the Committee on Professional Education of the American Public Health Association have been the subject of widespread editorial comment. Without exception the press has commended the committee for the high educational standards set. The *Journal of the American Medical Association* commented as follows:

> These recommendations should have a definite value in educating the public to the necessity for having well trained men in charge of our public health activities. They should also tend to discourage the too frequent practice of appointing state and local health officers as a reward for political service

or on account of some personal friendship. Perhaps the most important feature of this pronouncement by the American Public Health Association is the clear recognition of the necessity for medical as well as scientific training.

Hay Fever and Taxes — The search for a hay fever cure goes on year after year. While medical science ponders the problem, a correspondent of the *New York Times* comes forward with a suggestion that a remedy lies in—of all things—taxation. Establish a special tax on all vacant lands that are not clear of noxious weeds. . . . Have the health commissioner enforce the law and impose a good sized additional tax when land is not cleared well in advance of the hay fever season. So writes the *Times* correspondent, who believes that if such laws are enforced the offending weeds would disappear within 24 hours and the hay fever with them. We await with interest the first treatise on Taxation as a Factor in the Control of Hay Fever.

Home Accidents—In 1938, home accidents ranked seventh as a cause of death in the United States, being exceeded only by deaths due to heart disease, cancer, cerebral hemorrhage, nephritis, pneumonia, and tuberculosis. In addition, home accidents resulted in more than one-half of all accidental injuries. The prevention of home accidents is, therefore, an activity which should demand the attention of all persons interested in public health.

In view of the opportunity which the visiting nurse has to observe equipment and living habits in American homes, the Metropolitan Life Insurance Company recently solicited the aid of its visiting nursing staff in a study of home accidents among its policy holders. This study is perhaps the most comprehensive of its kind to be undertaken in the home safety field, and it promises to disclose much valuable information. It is being conducted to obtain original data regarding types, causes and locations of home accidents, and also to give the company nurses a greater appreciation of the need for, and methods of, safety teaching in the homes of policy holders. Results of the study will be published at a later date.

Health Education Institute—The program for the forthcoming Health Education Institute, which was printed in the August issue of the *Journal,* indicates that this year's session will be as profitable from an educational standpoint as those of preceding years. The faculty has again been wisely selected. It concludes outstanding authorities in public health and related fields. Those who attend the Institute will no doubt profit enormously from the papers and discussions that are scheduled. New technics, new developments, and new ideas will be presented, from which health educators will draw inspiration. We note with considerable interest that this year's program provides time for a "get together." This should be one of the most stimulating events of the Institute, teeming with informal shop talk and enthusiastic conviviality.

Housing the American Museum of Health—The American Museum of Health will be permanently housed in a building that is now occupied by the "Masterpieces of Art" Exhibit at the New York World's Fair. The site of the Fair is to be converted into a public park at the close of the 1940 run and most of the exposition buildings are to be demolished. The City of New York, however, was recently offered several of the structures for park purposes and the "Masterpieces of Art" building was accepted by Mayor La Guardia to serve as the permanent home of the American Museum of Health. The building will form an ideal setting for

the exhibits in that it has many spacious rooms that are well lighted and free of architectural obstructions. The exhibits that are now being shown in the Medical and Public Health Building at the Fair will form the nucleus of the permanent display.

Gutenberg — Five hundred years ago, a man by the name of Johann Gutenberg gave to the world an art that has since served all the arts. In 1440, Gutenberg devised a successful method of casting metal type which made printing possible. Today we cannot conceive of a world functioning without the facilities and benefits of printing, for this art surpasses all others as a medium for promoting human progress and welfare. So much of the work that is done in the field of health education rests upon the printed word that it seemed we should, in these columns, pay tribute to Gutenberg for the indispensable service rendered to our profession through his invention of printing 500 years ago.

American Museum Advisory Service—The American Museum of Health has inaugurated an advisory service for the purpose of assisting individuals and organizations in the development of health education materials. This service is known as Aids in Health Education, and headquarters have been established in the Hall of Medical Science at the New York World's Fair. The staff of Aids in Health Education will gladly render assistance in connection with the preparation of literature, visual aids, and other health education media. Services of the staff may be secured either by a personal call at the Museum or through correspondence.

CATCH-ALL

Sulfapyridine is now being distributed free in 23 states . . . Surgeon-General Parran's recent paper on preparedness should be included on your "must" reading list (*J.A.M.A.*, July 6, pp. 49–51) . . . "Choose to Live," the latest film produced by the American Society for the Control of Cancer, is an expert job—compact, informative, and entertaining . . . It was announced at the recent Home Economics Convention in Cleveland that strawberries are as high in vitamin C content (ounce for ounce) as orange juice . . . The Metro-Goldwyn-Mayer film on the life of Madame Curie has been abandoned, much to the disappointment of public health workers who had eagerly awaited its release . . . A top-notch annual report is that of the Children's Aid Society of New York called "Children in the News" . . . A new series of postage stamps known as the "Science Series" will be issued shortly by the Post Office Department, each stamp to bear the likeness of a famed scientist. Dr. Walter Reed is the public health hero who has been listed for commemoration in this series . . . It is reported that the infantile paralysis virus is not killed by ordinary water chlorination. Thus swimming pools may yet prove to be a factor in the spread of this disease . . . New films in the health field will no doubt materialize soon. In certain quarters plans are under consideration for the production of a film on either nutrition or home safety . . . Do you ever read the book reviews in *The Quarterly Review of Biology?* We recommend them not only because they say "what's what" about a book, but also because of the humorous touches that are found in many of the reviews attributed to Reginald, the Office Boy. Reginald

has become one of our favorite critics . . . It is understood that some consideration is being given to a possible demonstration for the control of acute rheumatic fever and rheumatic heart disease in an area that may be selected in a prominent eastern state . . . In New York State diphtheria has almost reached the vanishing point. In 1925, in the upstate area there were 4,370 cases and 338 deaths, and a death rate of 6.4 per 100,000. In 1939, the rate was 0.16 per 100,000. In the first 4 months of 1940, in a population of over 6 million, there was 1 death, as compared with 3 in the same period last year!

Escape from Reality

THERE are innumerable varieties of escape from reality, and every normal person indulges in some of them. One would be unwise and narrow-minded to classify all of them as futile and pathologic. The enjoyment of poetry, art, drama, music, hobbies in general, even the proper use of alcohol—all of these are momentary and, up to a point, permissible diversions from the realities of life. But when they are used to the extent that we are less willing or less able promptly to return to reality, they had best be left alone for then they have become pathologic. This is true also of academic education. . . . — Excerpt from the report of the Neuro-Psychiatric Institute of the Hartford Retreat, Hartford, Conn., April 1, 1940.

BOOKS AND REPORTS

A History of Tropical Medicine—*By H. Harold Scott, C.M.G., M.D., F.R.C.P. Lond., D.P.H., D.T.M., and H. Camb., F.R.S.E. Baltimore: Williams & Wilkins,* 1939. 2 vols. 1,165 pp. Price, $12.50.

This extensive work by the Director of the Bureau of Hygiene and Tropical Diseases of the London School of Hygiene and Tropical Medicine is an expansion of the Fitzpatrick Lectures delivered before the Royal College of Physicians of London, 1937–1938. In the preface the author emphasizes the difficulty of defining tropical diseases, but in the two volumes he deals with most of the important diseases which usually originate or are more prevalent in warm climates. Certain noteworthy omissions, however, are rickettsial diseases; trematode diseases, especially schistosomiasis; the filariases; and bacillary dysentery.

The first four chapters deal with the medical problems of the British Navy and Mercantile Marine, the Army, and the outlying portions of the Empire. These are followed by long chapters on malaria, blackwater fever, yellow fever, and trypanosomiasis and shorter chapters on leishmaniasis, leprosy, cholera, and plague. Still briefer chapters deal with undulant fever, relapsing fever, melioidosis, dengue, amebiasis, hookworm, and the four avitaminoses, beriberi, epidemic dropsy, pellagra, and scurvy. Brief mention is made of akee poisoning and ginger paralysis. Chapters are devoted to the Suez Canal, Panama Canal, and the relation of slave trade to disease. Finally, brief biographies and photographs are presented of fifteen pioneers in tropical medicine. There is a brief bibliography and an extensive author and subject index.

The author shows evidence of having explored a tremendous amount of historical literature, citing or quoting, perhaps too extensively, many works little known to the average reader. He even gives the original and translation of passages from Greek and Latin authors. The arrangement of the material is not very logical, containing many digressions which make it difficult to follow the historical trend. The author gives evidence of great familiarity with the British Empire but is often inaccurate in his references to diseases and places in the New World. There are also a number of inaccuracies or omissions in the names and work of some American authors. The discussion of avitaminoses has not entirely been brought up even to the date of the Fitzpatrick Lectures. Despite the defects, which are perhaps excusable on the basis of the extent of the subject, the reviewer feels that this is a valuable contribution to medical history and should be widely used as a reference work in medical libraries and by individuals particularly interested in tropical medicine.

HENRY E. MELENEY

Health Is Wealth—*By Paul de Kruif. New York: Harcourt, Brace,* 1940. 246 pp. Price, $2.00.

This book gives the story of a fight for a national program of human conservation which originated informally with a small band of physicians and public health men in Detroit. It also gives rather intimate stories of the National Health Conference in 1938 and the hearings of the Wagner Bill in 1939, both of which the author says

were "misled by certain government and labor group visionaries and crackpots"—"pseudoscientists" who seemed to believe that public health could be served best by "snubbing and damning the doctors," who, he rightly says, are nevertheless "fundamentally the arbiters of life and death of the people."

Concerning Miss Roche's conference, the lay groups were "in general uncritically enthusiastic" and the sums proposed for medical care were "astronomical," with no plan for raising the money. It was insinuated that the American Medical Association was against all health programs yet this body had not been consulted either by Miss Roche or "her medical brain trust." Among those who held the American Medical Association in contempt were advocates of compulsory health insurance. Concerning compulsory health insurance there is mentioned an illustration by Basil O'Connor, a layman, who pointed out that we are concerned with the tremendous number of deaths and injuries due to motor traffic yet no one would regard compulsory motor accident insurance as the chief weapon in combating this loss.

There are many other things that we would like to quote. The author gives the story of appointments for meetings which came to nothing, snubs where consultation was the wise and fair thing. For example, when the Committee from the House of Delegates of the American Medical Association, appointed to coöperate with the government, got to Washington they were treated politely but were shown that this was "a hearing" and not a conference with them as equals. Soon after came the indictment of the 5 officials of the A.M.A., who were representing some 113,000 doctors in the country. The author asks if the people of the country for one minute believe that these 113,000 doctors were criminals.

One chapter, "Public Health is Good for the Doctors," physicians could well read, and the following chapter, "Public Health Needs the Doctors," is a good lesson for the layman. The whole book is a powerful plea for public health and shows that the medical profession of the country is not only interested in it but necessary to it.

One fallacy is quoted a number of times with approval, credited to Dr. Peet as a health slogan, "It costs us less to save 'em than to bury 'em." Needless to say, those who are saved in youth must be buried later, even if they live the full span of life, so that while the life of a human being has been estimated as having certain money value by economists, the question of burial does not come in one way or the other as an argument for saving them from illness or death.

The contents of this book have been published over 5 years in the *Country Gentleman* and a number of the chapters are substantially as they appeared in that journal. It is virile, entertaining, and contains much food for thought. The author is a propagandist and the book abounds in laudatory adjectives. "All our geese are swans."

MAZŸCK P. RAVENEL

International Vital Statistics, Vital Statistics—Special Reports, Vol. 9, No. 36—*Bureau of the Census, Department of Commerce, Washington,* May 2, 1940. 114 pp.

Under the foregoing title the Federal Bureau of the Census has issued a special report which is of particular interest and value at this time. The report gives for fifty-odd countries, population statistics and data which reflect the status or changes in the population, such as rates of birth, death, marriage, divorce, migration, and the like.

Among the more interesting population figures are the following, given in

millions as of 1936: Japan 70.2; Germany 67.3; Italy and colonies 43.0; France 41.9; England and Wales 40.8; Poland 34.0; Spain 25.0; Roumania 19.3; Czechoslovakia 15.2; Netherlands 8.5; Belgium 8.3; Sweden 6.2; Switzerland 4.2; Denmark 3.7; Ireland 3.0; and Norway 2.9.

Percentage change in population from 1921 to 1936 ranges from a decline of 4.2 per cent in Ireland to an increase of 76.6 per cent in Palestine. Other interesting rates of increase are Mexico 33.0 per cent; Canada 25.3 per cent; Japan 23.7 per cent; United States 18.7 per cent; Spain 16.4 per cent; Italy 13.2 per cent; Germany 8.6 per cent; England and Wales 7.8 per cent; and France 6.8 per cent.

Population densities per square kilometer (0.4 square mile) range from 0.9 in Australia to 825.3 in Malta and Gozo. In Belgium the density is 272.6 per square kilometer; England and Wales 270.3; Netherlands 258.9; Japan 189.4; Germany 143.1; Italy 138.6; France 76.1; and the United States 16.7.

The birth rates per 1,000 population in the various countries for 1936 are as follows: Japan 29.9; Italy 22.4; Germany 19.0; the United States 16.7; France 15.0; England and Wales 14.8; and Austria 13.1. There is also given a table showing the net-reproduction rates which take account of the number of women in the childbearing ages.

Standardized death rates in the 1930's are shown to vary from 6.9 per 1,000 population in New Zealand to 24.1 in British India. The rate for the United States, 10.8 is one or two points higher than the rate for most of the North European countries. Rates at ages vary more for the young than for the old.

There is also a table showing annual immigration, emigration, and net migratory gain or loss in the United States. The peak of population increase by this method (815,303) occurred in 1913. The largest decrease (112,786) was in 1932. Figures for the years 1934–1938 are of greatest interest. They are —13,268 for 1934; —9,329 for 1935; — 2,385 for 1936; +7,302 for 1937; and +30,083 for 1938.

Enough has been given in this brief preview to indicate that this report should form a most useful source of information for the internationally minded. The Bureau of the Census is to be congratulated on its production.

A. W. HEDRICH

Education of the Handicapped: Vol. II, Problems—*By Merle E. Frampton and Hugh Grant Rowell. Yonkers-on-Hudson, N. Y.: World Book Co.*, 1940. 443 pp. Price, $2.80.

This book is the second contribution on the Education of the Handicapped by Drs. Frampton and Rowell of the Division of the Handicapped, Teachers College, Columbia University.

The first section should prove of value to school administrators, directors of school health services, teachers, doctors, nurses, laymen interested in social problems, and a host of others. In five short chapters the authors have outlined some of the major problems in educating the handicapped. Through a discussion of the problems, a philosophy is developed for the reader that should clarify some of the sentimental and confused thinking that now exists in this field.

Heretofore, the problems of the handicapped have been presented piece-meal. The authors have accomplished much by discussing for us, in a general way, the total field of education of the handicapped. We now have a source that can be used to synthesize and crystallize the thinking of all workers with the handicapped or in related fields. Of course, many points made by the authors are debatable de-

pending on one's point of view and experience.

Of special merit are the two chapters dealing with the Psychological Problems and Problems of Economic Security. Each year, large sums are expended to discover the handicapped. Everything that would aid the handicapped individual to make his way in so-called "normal society" is tried. Special programs of treatment and education are developed to meet their needs; vocational guidance, training, and special rehabilitation work are planned for many. Finally, the young man or woman attempts to secure employment. The blank wall that is met is heartbreaking. One wonders why all the time, money, and effort were expended to fit the handicapped for their rightful place in "normal" society, when we definitely state by law and act that we cannot find a place for them in a productive society.

The second section deals with problems affecting each of the special handicapped groups. These cover the blind, the partially-sighted, the deaf, the hard-of-hearing, those with speech difficulties, the crippled, the undervitalized, cardiacs and tuberculous, those with cerebral palsy, the mentally handicapped, and the socially handicapped. This portion of the book should be of real interest to all educators, especially to those principals and teachers who do not have recourse to special teachers or consultants in the various areas, when confronted with a specific problem. Undergraduate and graduate students in education may find this section of value when seeking an area of specialization. School and private physicians, school nurses, and others engaged in the health guidance programs would profit by a study of the educational problems faced by each of the different types of handicaps. To understand and help people we must have an understanding of their background. This section fills just this need.

In the third and final section are presented some special problems that have been solved in actual practice. This is a small section and should have been expanded. However, the authors state that they plan to publish a series of books covering methods and activities for each of the special areas.

This book meets an expressed need and should aid materially in clarifying our thinking with regard to the handicapped. The authors have indicated the fields that need clarification and have placed special emphasis on the problems that demand further research. Objective research and experimentation can aid in the solution of these problems. S. F. LIFSON

The First Five Years of Life—The Preschool Years. *From The Yale Clinic of Child Development—By Arnold Gesell, Ph.D., M.D., Henry M. Halverson, Ph.D., Frances L. Ilg, M.D., Helen Thompson, Ph.D., Burton M. Castner, Ph.D., Louise Bates Ames, Ph.D., and Catherine S. Amatruda, M.D. New York: Harper,* 1940. 393 pp. Price, $3.50.

There is no book of which this reviewer is aware that gives a more complete picture of the normal growth and development of the preschool child in so compact a form as this latest volume by Arnold Gesell and his Associates in the Yale Clinic of Child Development.

The care with which the material has been selected out of twenty years of fundamental research is evident on every page. We have here not only the results of carefully planned scientific observations but also a philosophy and methods which should point the way to productive future studies. The task "is to get a better appreciation of the individual ways in which individual preschool children mature." We grasp the central concept of this illuminating vol-

ume when we realize in its own words that "The *total child* ceases to be an academic abstraction as soon as we try to ascertain the grouping of his behavior traits and the trends of his growth career."

The contributors to this volume have preserved a remarkable unity of purpose in presenting a great diversity of material. The scope of the work may be indicated by a few of the chapter headings: The Nature of Mental Growth; Motor Development; Adoptive Behavior; Language Development; Personal-Social Behavior; Individuality and Its Characterization; Developmental Supervision and The School Beginner.

This reviewer having a keen interest in photography is especially impressed with the pictorial illustrations covering twenty-one pages. A number of the "angle shots" actually speak for themselves. As. Dr. Gesell succinctly states, "Behavior has shape. . . . The camera captures the visible profiles of child behavior and gives us a great many hints of underlying attitudes, strivings, and satisfactions." The section on Examination Records and Arrangements should prove very helpful to all those actually interested in growth and development of preschool children. A list of 142 selected references completes the volume. Here is a book that cannot be too highly recommended.

RICHARD A. BOLT

Index to the Proceedings, Journal and Other Publications of the American Water Works Association. 1881–1939—*New York: American Water Works Association* (22 East 40th St.), 1940. 281 pp. Price, $2.00.

An excellent guide to material which has appeared in the American Water Works Association *Proceedings* and *Journal* from 1881 through 1939. The book is introduced to the reader by brief yet comprehensive instructions as to how to use the index. Technical topics are then listed with their respective page numbers and directly following each main topic are listed cross references. The topical subjects are printed in large, heavy-type caps—easy to find; the cross references are printed in small letters. Cross references are generously given and the standard method is used in listing papers. In the back of the book, there appears an author index and also a list of other publications issued by the American Water Works Association, where these publications are available, and the price of each. ARTHUR P. MILLER

Bibliograhy of Swimming—*Compiled by Frances A. Greenwood. New York: H. W. Wilson Co.,* 1940. 308 pp. Price, $4.25.

This bibliography of texts and articles on the swimming pool, its sanitation, etc., is a valuable product containing as it does 230 pages of references.

It is not to be considered as complete, however. For example, we find no reference to the 1937 Report of the Joint Committee on Swimming Pools and Other Bathing Places published in *Beach and Pool.* Of the bibliography cards on file in this office (Department of Health and Physical Education, University of Buffalo) approximately 20 per cent of the material published before 1939 does not appear in this Bibliography. This "before 1939" is set up arbitrarily as it is realized that a text of this sort naturally lags several months behind current publications.

CHARLES H. KEENE

We, the Parents—*By Sidonie Matsner Gruenberg. New York: Harper,* 1939. 296 pp. Price, $2.50.

Parents who would like to be scientific and serious minded about the business of child guidance, and yet be able to relax a little and enjoy their children

at the same time, will find this book an inspiration. The author having brought up her own family most successfully is unusually well qualified to advise other parents. She brings to her readers a seasoned point of view from her own experience in parenthood and from her many successful years as an educator.

Mrs. Gruenberg discusses with real wisdom such subjects as the following: influences of radio, movies, and so-called "bad" books on children; children and money; maintaining discipline with a minimum of punishment; how to discuss questions of birth, death, sex, and other similar subjects with children, naturally and simply.

In her own words, modern parents "want to know how to understand the nature of these children they are guiding. When, for instance, four year old Johnny pushes over his ten months' old sister who is just learning to walk, we no longer ask, 'How shall I punish him so that he won't do that again?' Our greater concern is not that Johnny is *causing* trouble, but that he is *in* trouble. We know that we have to help him out of it."

This book is highly recommended for parents, doctors, teachers, social workers, and all adults who wish to understand children better, and how to guide them more intelligently.

ETHEL GORDON

A Doctor's Holiday in Iran—*By Rosalie Slaughter Morton, M.D. New York: Funk & Wagnalls,* 1940. 335 pp. Price, $3.00.

This story is the result of two visits made to Iran by the author. It contains a great deal of history of this ancient country with word pictures of famous old cities, shrines, gardens, roads, bazaars, gems of architecture, etc. However, we are particularly interested in the chapters dealing with health.

The author says that the part played by doctors in the advance of Iran is far-reaching and important since the things which have so far held it back are in some way or other concerned with the lack of hygiene. Interesting pictures are given of the diseases which are most prevalent, and of the clinics which are so closely bound up with the work of missions that it is not easy to separate them. Medical missionaries have been chiefly responsible for the groundwork of modern living which is now found in Iran. With infinite patience they have taught the ways of the Western world and given to the Iranians a constantly increasing respect for Christianity and for Westerners. However, the wonderful work of these missionaries has been able to bear fruit chiefly through the vision and aid of the Shah Riza Pahlavi, who during his 14 years of rule has utilized every force for the advancement of his people. Although educational and medical work has been going on for something like 100 years, it is only during the last 10 or 12 years that it has reached its full flower, due to the influence of the present Shah.

The descriptions of the clinics are not only interesting but fill one with admiration for the competence, unselfishness, and devotion of the medical missionaries On the other hand, the description of the cases which present themselves are depressing. One cannot but admire the courage which enables these medical missionaries to carry on in their unfavorable surroundings and in face of the medical difficulties which they encounter. In spite of the great advance in education, there is still an enormous amount of superstition which leads not only to distinctly unhygienic measures, like blowing, spitting, and stroking to heal the sick, but to the use of charms which are without value.

The book is well written. The author has traveled widely in other

countries as well as in Iran. On the visits of which she now writes, she traveled some 3,300 miles, many of which were hard going, due to the bad roads and inferior cars. Naturally her interests related especially to the women of the country, who even more than the men, are realizing the benefits of modern customs since the present Shah has abolished the veil and opened a new world to those who have been for so many centuries suppressed. However, as the author says, the unveiling of women is only a part of what has been done, as general education has lifted from the peasant minds the veil of ignorance, modern medicine has removed the veil of disease, and the veil of spiritual bondage is being lifted.

We cannot but wonder if the author has not been a little bit carried away by what she has seen, and perhaps the glamour of this ancient country, for she asks, "If Iran, by idealism and force of will, is making great progress, what is our weakness, that we, with a background of open-mindedness and opportunity, are, by comparison, standing still?"

The book is well illustrated and full of interest. "Iran is a reborn nation, with a magnificent future awaiting her in which her ancient racial intelligence and imagination will still find keen expression, in modern terms."

MAZŸCK P. RAVENEL

Standard Methods of the Division of Laboratories and Research of the New York State Department of Health—*By Augustus B. Wadsworth, M.D. Baltimore: Williams & Wilkins,* 1939. 681 pp. Price, $7.50.

The second edition of the "Standard Methods" employed by the New York State public health laboratories follows the same general plan as the first in setting forth the methods in use in the various departments of the Division of Laboratories and Research; but includes some new material, chiefly in the form of recently adopted methods. There are, for example, a new quantitative technic for complement-fixation tests; a revised colloidal gold test; directions for the Neufeld method of typing pneumococci; directions for the production, concentration, and standardization of certain therapeutic antisera; a short section on the determination of hydrogen ion concentration, and a bibliography on quantitative chemical procedures. This work is the only comprehensive American publication in book form dealing entirely with public health laboratory technics, and covering the field adequately. It is a valuable reference book.

The section on "Methods used in the Antitoxin, Serum and Vaccine Laboratories" is especially useful since the material contained therein is not to be found elsewhere in such detailed and thorough, though concise, form.

WILLIAM D. STOVALL

Let's Talk about Your Baby—*By H. Kent Tenney, Jr., M.D. (2nd ed. rev.). Minneapolis: University of Minnesota Press,* 1940. 115 pp. Price, $1.00.

This little book appears in an attractive new dress as the second revised edition of suggestions which Dr. Tenney prepared originally for his private patients. It departs from the usual style of other manuals by putting into the mouth of the baby at the beginning of each chapter certain questions and statements which are answered conversationally in a very informal but practical manner in the latter part of the chapters.

The material taken up for discussion follows the usual lines of what mothers, and incidentally fathers, should know about the growth, development, and daily care of the normal baby. It contains at the end places for a record of the important events of early life and a convenient index. The book is easy

and delightful reading even for a reviewer through whose hands have passed many books of a similar nature. It should prove very helpful to mothers of young children and also save the busy physician many "night calls."

RICHARD A. BOLT

The Science of Psychology—*By Raymond H. Wheeler (2nd ed.). New York: Crowell,* 1940. 436 pp. Price, $2.75.

This book is a revision of a text in elementary psychology written for college students ten years ago by Dr. Wheeler, who has been a follower of the Gestalt School of Psychology for many years. The arrangement of the book and the style of the presentation is in accord with the theoretical premises of the author; that is, that the organism acts as a whole and that no understanding of behavior at any time can be obtained by a summation of the reactions of the various parts. The whole is more than the sum of its parts. Thus, the second chapter begins with an analysis of social behavior. The author then proceeds to the personality development of the individual. Following, he makes further analyses of the individual's behavior into his emotions, intelligence and problems of learning. Subsequently, he discusses observational behavior and some of its finer aspects and finally the nervous system in its relation to behavior. Certainly the text presents a psychological rather than a logical approach to the study of human behavior.

As a clinical psychologist, I agree with his favorable treatment of the organismic theory of behavior, but I am in considerable disagreement with the author's rather naive and almost lay approach to the technics and theories of psychoanalysis. In his very brief discussion of this field. he shows an amazing ignorance of psychoanalytic theory as well as practice and makes many rash statements. For example:

> In primitive races the first signs of sex interest arising before maturity are directed toward the opposite sex and not, except in unusual cases, toward the individual himself or toward a member of the same sex.

Any student of behavior who has observed masturbatory practices, exhibitionism, and exploration of sexual organs of other children in 3 or 4 year olds, can dispute this statement. Further,

> Time after time advice to adolescents based on Freudian principles has done more damage than good.

One would assume from this statement that "advice" can be given "to adolescents based on Freudian principles." Any psychologist who has an understanding of what is involved in the therapeutic handling of adolescents' problems would never interpret Freudian technics or theories as "advice" to be given to anyone, much less to adolescents. And, again,

> Time after time in the course of reading Freudian literature, youth has been led to imagine personal maladjustments that did not exist.

If such an argument were to be used with respect to medical texts or books on pathology, one might be obliged to discount all of the great work on bacteria and diseases because young people reading the books might imagine they had the disease. On the whole, the author misinterprets concepts concerning psychoanalytic methods which he has apparently learned through reading and which, fundamentally, cannot be properly learned without basic clinical experience.

The author presents some of the usual experimental material corroborating the laws and principles of human behavior as seen from the point of view of the Gestalt psychologist. The reviewer's impression is that while much of the material is valid in certain sections, in others, explanations for behavior are very superficial and frequently disre-

gard motivation as an essential factor in understanding behavior, despite the fact that motivation is supposed to be a major consideration in Gestalt psychology. On the favorable side it might be stated that the book represents, on the whole, a somewhat more desirable trend in psychology from the point of view of organization, as well as from the point of view of its greater emphasis upon the reaction of the organism in its total personality setting.

HENRY HANSBURG

Your Child's Development and Guidance, Told in Pictures—*By Lois Hayden Meek, Ph.D. New York: Lippincott,* 1940. 166 pp. Price, $2.00.

This small, compact book contains information on the subject that one would usually find in several large volumes. The language is simple and direct, without superfluous words or technical phraseology. One feels that the author has comprehensive technical knowledge of her subject, tempered by a very flexible philosophy. Practical, common-sense advice is given with a very real understanding not only of child nature and needs, but also of "parent" nature and needs. She has confidence in the ability of the average parent "to select those things (in the realm of child guidance) that are appropriate and useful for his own child."

She deals with such phases of child development and guidance as the following: physical growth and development from birth to six: daily schedule; habits of eating, sleeping, elimination, and "getting dirty and getting clean again"; social relationships with adults and other children; emotional growth and development.

Part of the charm as well as the educational effectiveness of the book is due to the 101 photographs and 61 line drawings of children, scattered throughout the book, comprising from one-third to one-half of its contents.

A quotation from its first pages may help those seeking an intriguing book on the subject to understand why this one was chosen for review. "One of the most exciting things about children is that they change. The new-born slowly grows into a rollicking one-year-old taking his first steps. The infant becomes a toddler running here, there, and everywhere. The toddler gets steady on his legs, grows tall, loses his front teeth. And on he moves, day by day, year by year, along life's pathway. Mother loses her baby and gains a child, only to see him become a youth with lanky legs and fuzzy face in a few years. It takes wise and flexible parents to be able to keep up to the rapid changes in children's development."

ETHEL GORDON

The Compleat Pediatrician: Practical, Diagnostic, Therapeutic and Preventive Pediatrics—*By W. C. Davison, M.A., M.D. (3rd ed.) Durham, N. C.: Duke University Press,* 1940. 317 pp. Price, $3.75.

The third edition of this comprehensive handbook of up-to-date pediatric information attests its usefulness. It might well be adopted as a *vade mecum* for pediatricians and general practitioners having anything to do with children. This volume, as in previous editions, has brought together the important facts from pediatric literature and has arranged them for ready reference, having in view their practical application.

The preventive trend in pediatrics is emphasized by the space given to nutritional requirements, feeding, diets, growth, development, and child care, and guidance. The book is thoroughly indexed and cross referenced so that it is easy to follow through any symptom or condition occurring in a number of different diseases. Helpful tables are scattered throughout the book, for instance the ones on "Differentiation of

the Most Common Types of Jaundice in Children," and "Contagious or Infectious Diseases." The volume is bound in flexible dark green covers and is a credit to Duke University Press.

RICHARD A. BOLT

A Manual of the Common Contagious Diseases *(3rd ed. rev.)—By Philip M. Stimson. Philadelphia: Lea & Febiger,* 1940. 465 pp. Price, $4.00.

Even though one may prefer the inclusive word communicable in place of the less exact term of contagious diseases there is nothing else to justify an objection to the content or form of this admirable manual, revised and expanded, by one of the very competent clinicians and level headed teachers of practical preventive medicine, to whom health officers and physicians, as well as their associates among nurses in private and public practice, have been so long deeply indebted.

If all physicians knew the exact facts as here described and all health officers made their control procedures consistent with the known period of incubation and communicability there would be less trouble for patient and family and greater respect by the public for the measures taken in its interest.

This book is reliable as a guide to the hospital administrator and nurse educator as well as a competent source of reference for the student and practitioner of medicine.

It is to be highly recommended.

HAVEN EMERSON

Facts About Nursing, 1939—*By The Nursing Information Bureau of the American Nurses' Association, coöperating with the National League of Nursing Education and the National Organization for Public Health Nursing,* 50 W. 50th St., New York, N. Y., 1940. 58 pp. Price, $.25.

Here is a snappy paper-covered booklet, full of meaty facts chiefly about professional nurses in the United States, simply stated, easily read.

Numbers of nurses in the three major fields of nursing are given; their hours of employment, salaries, ratio of population, A.N.A. membership, registration by states, distribution by states, etc., are combined in the shortest possible space in statistical form.

The material is a godsend to busy physicians and others who find themselves face-to-face with the preparation of a commencement address in a nursing school, or with any address or paper in which any phase of nursing is concerned, for it represents hours of reading on this subject boiled down into 58 pages.

EVA F. MACDOUGALL

The Dysenteric Disorders—The Diagnosis and Treatment of Dysentery, Sprue, Colitis and Other Diarrhaeas in General Practice—*By Philip Manson-Bahr, C.P.M.G., D.S.O., M.D., F.R.C.P., with an appendix by W. John Muggleton, M.S.M. Baltimore: Williams and Wilkins,* 1939. 613 pp. with 9 colored and 14 black and white plates, and 106 illustrations in the text. Price, $8.00.

This book by the Director of the Division of Clinical Tropical Medicine of the London School of Hygiene and Tropical Medicine is an important contribution to a field in which etiology is often obscure, diagnosis difficult, and treatment a major problem of clinical medicine. The author has had a notable career particularly devoted to this group of diseases. After five introductory chapters, he takes up in detail the bacillary dysenteries, the protozoal and helminthic dysenteries and diarrheas, other infective diarrheas, the steatorrheas, and other affections producing dysenteric symptoms. One of the most important chapters is that on sigmoidoscopy. Each disease is dealt with in a

logical manner with discussions of etiology, pathological and physiological changes, symptomatology and the evaluation of various forms of treatment. The author has a wide knowledge of the literature and this together with his intimate experience with most of the subjects discussed makes the book a valuable guide to the clinician.

The appendix prepared by Manson-Bahr's assistant for many years is an important laboratory aid in diagnosis. There is a bibliography of 23 pages and a detailed index. One of the best features of the book is the illustrations, many of which present the macroscopic lesions of the tongue and intestine. Those reproduced in color are especially valuable. There are also many reproductions of x-ray pictures of the colon. The drawings of intestinal protozoa have mostly been borrowed from Dobell and Wenyon and are supplemented by two colored plates by the senior author.

Although the British point of view predominates and some forms of treatment vary from approved practices in the United States, the reviewer believes that this book should be available generally in medical libraries and in the offices of practitioners who deal with this group of diseases. It is splendidly printed on glossy paper which takes the illustrations well, and the authors and publishers are to be commended on the result. HENRY E. MELENEY

Exercise and Keep Fit—*By Terry Hunt. New York: Prentice-Hall,* 1940. 202 pp. Price, $1.96.

About half of this text is devoted to general advice on how to keep well: mental health, the use of cathartics, sleep, diet, play, hygienic care of the body, posture, etc.

The balance is made up of descriptions of different exercises—illustrated—mentioning in each case the purpose of that particular exercise. The descriptions and illustrations make the exercise clear.

While these exercises seem clear and foolproof, it is wiser that they be started under expert advice and observation, both as to the total amount and choice of exercises and the proper technic of each. CHARLES H. KEENE

Correction—On page 830 of the July *Journal* an error appeared. Of course, where Sinclair Lewis was mentioned as author of *The Jungle,* Upton Sinclair was intended.

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH.D.

Virus vs. Ultra-violet—In one of two identical children's wards, ultra-violet lamps were installed. The infants in the irradiated-air room had about half as many colds as those in the control room during two seasons of operation. Complications were reduced, too.

BARENBURG, L. H., *et al.* Effect of Irradiation of the Air in a Ward on the Incidence of Infections of the Respiratory Tract. Am. J. Dis. Child. 59, 6:1219 (June), 1940.

Beware C O—Proof is offered that prolonged exposure to carbon monoxide may have damaging effect upon health even though there is no history of severe asphyxiation or loss of consciousness.

BECK, H. G., *et al.* Carbon Monoxide—A Domestic Hazard. J.A.M.A. 115, 1:1 (July 6), 1940.

Care and Feeding of Mosquitoes—How to raise malaria mosquitoes in captivity. Powdered dog biscuit is the larval food, and a shaved rabbit is the daily fare of the more-deadly-than-the-male females.

CROWELL, R. L. Insectary Rearing of Anopheles Quadrimaculatus. Am. J. Hyg. 32, 1:12 (July), 1940.

Accuracy of Census Age Statements—This cross-check on census returns by matching against a subsequent census, person-by-person, suggests that at least 25 per cent of the whites and 40 per cent of the colored individuals must have had their age reported incorrectly at one census or the other. The tendency of under- or over-age statement was studied.

DENSEN, P. M. Family Studies in the Eastern Health District. Am. J. Hyg. 32, 1:1 (July), 1940.

First Line of Defense—Among the many curious items of interest in this paper is the history of maritime quarantine in colonial America when "sickly vessels" or "boats from sickly ports" were ordered to come not nearer than one mile from shore.

HAMPTON, B. C. Development of the National Maritime Quarantine System of the United States. Pub. Health Rep. 55, 28:1241 (July 12), 1940.

History, Lice, and Rats—Though there have been recorded but 500 human cases of plague, it is known that the disease is widely spread among squirrels, chipmunks, wood rats, field mice, prairie dogs, marmots, etc., and that fleas, lice, and ticks on all wild rodents may carry the disease. How soon the infection will reach large cities in the East where the thriving and friendly rat population will again jeopardize their human neighbors is only a matter of conjecture. Plague jumped quarantine bars, spread slowly despite our best efforts. Who is foolish enough to say that it can't burst into a real flame again?

HAMPTON, B. C. Plague in the United States. Pub. Health Rep. 55, 26:1143 (June 28), 1940.

Better Blood Tests—Reported here is the marked improvement in the sensitivity, specificity, and accuracy of the serological tests for syphilis as carried on by the principal state laboratories. This fact and the account of what is being done to effect further improvements in technics should go far to allay the fears of the doubting-Thomases who throw cold water on syphilis control projects that are based

upon blood tests of large groups of our people.

HAZEN, H. H., *et al.* Serodiagnostic Tests for Syphilis as Performed in State Laboratories in 1938 and 1939. Ven. Dis. Inform. 21, 6:171 (June), 1940.

Adequacy of Oral Hygiene Programs—From this study a sort of mathematical formula is deduced: the number of carious processes developing in the teeth of high school children, less the number of fillings installed, seems to bear a set ratio to the number of teeth that are lost, and this is an index of the adequacy of public dental care.

KLEIN, H., and PALMER, C. E. Studies on Dental Caries. Pub. Health Rep. 55, 28:1241 (July 12), 1940.

Measuring Nutritional Deficiencies—About 2,500 high school children in New York City are to be given an examination to determine nutritional status, the examination to consist of 27 different items. Most of these methods of testing have not been applied in large scale nutritional surveys, so it is reasonable to anticipate some interesting findings—which are to be published later.

KRUSE, H. D., *et al.* Medical Evaluation of Nutritional Status. Milbank Quart. 18, 3:257 (July), 1940.

Typhoid Vaccine—About one hundred immunized persons developed typhoid fever. The mortality was 4 per cent against a 10 per cent mortality among non-immunes. Only 14 per cent showed a typical course. This experience occurred in Spain when grossly polluted water was drunk.

MALBIN, B. Typhoid Fever Occurring in Immunized Persons. J.A.M.A. 115, 1:33 (July 6), 1940.

One Dose Not Enough—Thirteen cases of diphtheria in children who had once received a single dose of alum precipitated toxoid are reported; no apparent difference in symptoms was recorded. This is evidence of the value of insisting upon two-dose treatments.

MURPHY, J. N., *et al.* Clinical Cases of Diphtheria Occurring in Patients Who Had Previously Received One Injection of Alum Precipitated Diphtheria Toxoid. Canad. Pub. Health J. 31, 6:276 (June), 1940.

Conclusion Jumping Department—Soldiers from the South have a materially different cancer experience from Yankees. Half the Southerners with cancer had skin primary malignancies whereas only 27 per cent of the Northerners were so affected. Exposure to the intense sun in childhood rather than during the adult years seems to be the cause. It is suggested that exposure to ultra-violet rays in infancy may be one way of forestalling the internal cancers of later years.

PELLER, S., *et al.* Cancer in Its Relations to Climatic Conditions During Childhood and Adolescence. Am. J. Hyg. 32, 1:39 (July), 1940.

Workers Wrapped in Cellophane—Resin film coated fabrics will protect workers from some skin irritants used in industrial processes. A design for the well-dressed employee is offered.

SCHWARTZ, L., *et al.* Clothing for Protection against Occupational Skin Irritants. Pub. Health Rep. 55, 26:1158 (June 28), 1940.

Out from Confusion—During the past year and a half, concludes this paper, 1,500 persons with dietary deficiency diseases have been treated without a death, whereas more than half the pellagrins used to die. This result is attributable to the administration of appropriate vitamin preparations combined with an adequate, well balanced diet.

SPIES, T. D., *et al.* Some Recent Advances in Vitamin Therapy. J.A.M.A. 115, 4:292 (July 27), 1940.

Making the Most of Leisure Time—Health Workers who see the need of more and better mental hygiene will find much of interest in this dissertation on creative leisure time activities for young and old alike.

STIEGLITZ, E. J. Wise Investment of Leisure. Sci. Month. 51, 2:147 (Aug.), 1940.

What Doctors Want To Know—In this order the inquiring doctors asked questions about syphilis: (1) appropriate treatment schedules, (2) choice of drugs, (3) serologic tests, (4) reactions to treatment, (5) accuracy of diagnosis, (6) differential diagnoses, (7) and a poor seventh, control of infectiousness. Congenital syphilis rates seventeenth, and public policy, twenty-seventh.

STOKES, J. H., *et al.* A study of Consultation by Correspondence in Syphilis (with addenda from which this annotation was lifted). Ven. Dis. Inform. 21, 5:129 (May), 1940.

Landmarks in Our National Evolution—Three of six papers included in the first installment give promise of a most illuminating symposium on population trends and social welfare. When the remaining papers are published they will all be bound for your lasting convenience. It would seem that, as we are an aging population, we had better get busy improving the health and productivity of the middle-aged. On the other hand we must strengthen the child health services in some of the more benighted parts of the country.

THOMPSON, W. S. Outstanding Population Trends Affecting Problems of Social Welfare (and two related papers). Milbank Quart. 18, 3:189 (July), 1940.

After the Sanatorium—In Ontario a scheme for the support and after-care of tuberculosis sanatorium graduates has been in effect 2 years, and its value established; not yet has much been done about rehabilitation.

WICKS, C. A. The Post Sanatorium Care of Tuberculous Patients in Ontario. Canad. Pub. Health J. 31, 6:259 (June), 1940.

Anent Rabies Vaccination—Much of the rabies vaccine now being produced appears to have little antigenic value, but this finding will doubtless have little dampening effect upon the perennial enthusiasm of the proponents of canine vaccination.

WYCKOFF, R. W. G., and BECK, C. E. The Potency of Anti-rabic Vaccines. J. Immunol. 39, 1:17 (July), 1940.

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PREVENTIVE MEDICINE. By Mark F. Boyd. 6th ed. Philadelphia: Saunders, 1940. 588 pp. Price, $4.50.

WONDER STORIES OF THE HUMAN MACHINE. Ten pamphlets describing the Human Body and Its Workings. Chicago: American Medical Association, 1940. Set $1.00. Single copies $.15.

MANUAL OF MEDICAL AND SURGICAL EMERGENCIES. J. C. Geiger, Editor. San Francisco: Stacey, 1940. 199 pp. Price, $2.50.

INFLUENCE OF A PUBLIC HEALTH PROGRAM ON A RURAL COMMUNITY: Fifteen Years in Rutherford County, Tenn., 1924–1938. By W. Frank Walker and Carolina R. Randolph. New York: Commonwealth Fund, 1940. 106 pp. Price, $.25.

THE DEVELOPMENT OF PUBLIC HEALTH IN CANADA. Edited by R. D. Defries. Toronto: Canadian Public Health Association, 1940. 184 pp. Price, $1.25.

THE CRIPPLED CHILD IN NEW YORK CITY. Report of the Commission for Study of Crippled Children, City of New York, 1940. 218 pp.

HELPING ADULTS TO LEARN. By John Chancellor, Editor. Chicago: American Library Association, 1939. 296 pp. Price, $3.00.

MANSON'S TROPICAL DISEASES. By Philip H. Manson-Bahr, Editor. 11th ed. Baltimore: Williams & Wilkins, 1940. 1083 pp. Price, $11.00.

INDUSTRIAL MICROBIOLOGY. By Samuel Cate Prescott and Cecil Gordon Dunn. New York: McGraw-Hill, 1940. 541 pp. Price, $5.00.

A RESEARCH CONFERENCE ON THE CAUSE AND PREVENTION OF DENTAL CARIES. Sponsored by The Good Teeth Council for Children, Inc., Chicago, 1938. 178 pp. Price, $2.00.

NATIONAL COMMITTEE ON MATERNAL HEALTH. Report on the Sex Question by the Swedish Population Commission. Translated and Edited by Dr. Hamilton. Baltimore: Williams & Wilkins, 1940. 182 pp. Price, $2.00.

RHEUMATIC FEVER: Studies of the Epidemiology, Manifestations, Diagnosis, and Treatment of the Disease During the First Three Decades. By May G. Wilson. New York: Commonwealth Fund, 1940. 595 pp. Price, $4.50.

SAFE AND HEALTHY LIVING. By J. Mace Andress and I. H. Goldberger, et al. New York: Ginn & Co., 1939.

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Building Good Health	.84
Helping the Body in Its Work	.84
The Healthy Home and Community	.88

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GETTING READY TO BE A MOTHER. By Carolyn C. Van Blarcom. (4th ed. rev.) New York: Macmillan, 1940. 190 pp. Price, $2.50.

MOSQUITO CONTROL: Practical Methods for Abatement of Disease Vectors and Pests. By William Brodbeck Herms and Harold Farnsworth Gray. New York: Commonwealth Fund, 1940. 317 pp. Price, $3.50.

THE VIRUS: Life's Enemy. By Kenneth M. Smith. New York: Macmillan, 1940. 176 pp. Price, $2.00.

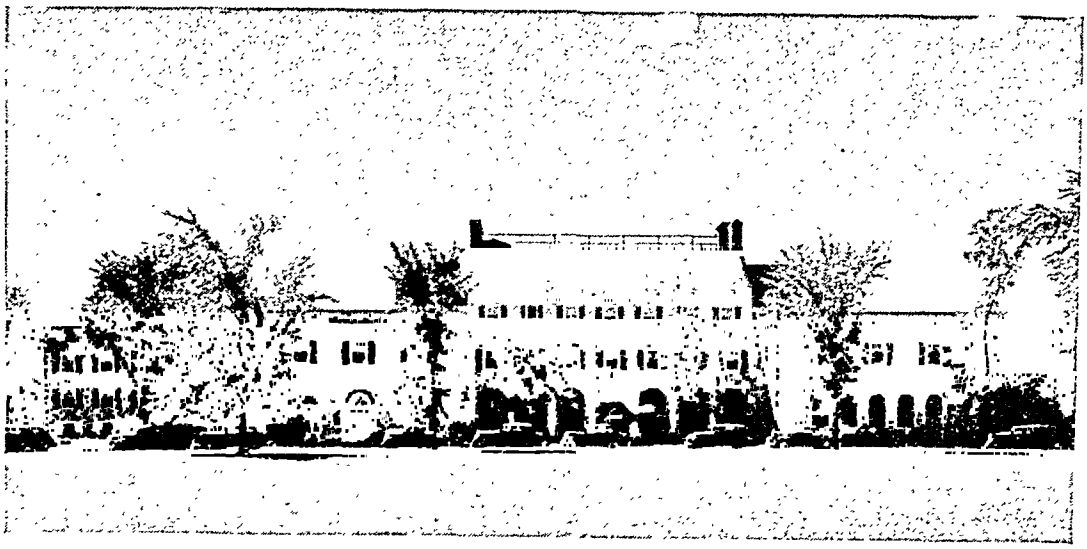
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THE CHANGING TASK OF THE SCHOOL PHYSICIAN. By Benjamin Spock. New York: Progressive Education Association, 1940. Price, $.50.

THIRTY-THIRD ANNUAL REPORT OF THE METROPOLITAN WATER BOARD, 1938. By Lt.-Col. E. F. W. Mackenzie, O.B.E., M.C., M.B., D.P.H. London: P. S. King & Son, Ltd., 14, Great Smith Street (Westminster), 1940. 118 pp. Price, $2.75.

FIGHTING QUACKS WITH FACTS. A manual of educational technics for use in venereal disease quack control programs, with a summary of factual data and a listing of educational materials. By Howard Ennes. Special V. D. Education Circular No. 1, July 1, 1940. Washington: Federal Security Agency, U. S. Public Health Service. 21 pp.



Dearborn Inn

Detroit Entertainment

THE meeting of the American Public Health Association in Detroit will not be all work and no play, according to the plans of the Michigan Committee.

Members who arrive on Sunday may attend the broadcast of the Sunday Evening Hour in Masonic Temple through the courtesy of the Ford Motor Company. A block of 500 seats for members of the Association has been reserved, and in order that those who wish to attend may be sure to have a ticket the committee suggests that reservations may be made now through the secretary of the committee at 3919 John R. Street, Detroit, Mich.

The ladies will receive particular attention on Monday afternoon when a tea will be held in their honor in the Esquire Room of the Book-Cadillac Hotel.

The Michigan Public Health Association is combining its meeting for this year with that of the Association, and its business meeting, which will be a luncheon meeting, will be held on Monday at 12:30 P.M. in the Crystal Ballroom of the Book-Cadillac Hotel. It is planned at this luncheon to honor former presidents of the Association.

On Monday evening the National Organization for Public Health Nursing will honor Miss Grace Ross, their president, who has been director of nursing for the Detroit Department of Health for 25 years. A dinner is planned, with the well known writer and speaker Margaret Culkin Banning to discuss "A Citizen Looks at Public Health." An invitation is extended to all members of the Association who wish to attend.

The Women's Entertainment Committee invites the visiting ladies to view an exhibit at the Art Institute on Wednesday as part of a trip, and to have tea at the Grosse Pointe Yacht Club before returning to the hotels. The trip will cover the east side of Detroit and will follow the river and the lake to the Yacht Club, which is a show place extending out into Lake St. Clair.

The First General Session, which will include a hand of welcome from Michigan to members of the Association, will be followed by a reception to the President and President-elect, and dancing in the ballroom of the Statler Hotel.

Sessions will be suspended on Thursday afternoon in order that those who



Masonic Temple

wish to visit Greenfield Village in Dearborn may be free to do so. Busses will leave the Book-Cadillac Hotel at 1 P.M., and go directly to Greenfield Village where a sightseeing tour will be conducted which will include the Edison Institute, a memorial to Abraham Lincoln, the transplanted scenes of periods in Edison's life, the Cotswold Cottage, the Martha and Mary Chapel, and many other points of interest in the early life of this country which were picked up and set down as examples of the pioneer spirit of America. Following the trip through the village, tea will be served to the visitors at Dearborn Inn which is close by.

On Wednesday evening the Michigan Public Health Association will be responsible for a General Session at which will be demonstrated and broadcast on the air an actual dramatic radio presentation. The Detroit News Players will be responsible for this presentation, and the broadcast is made



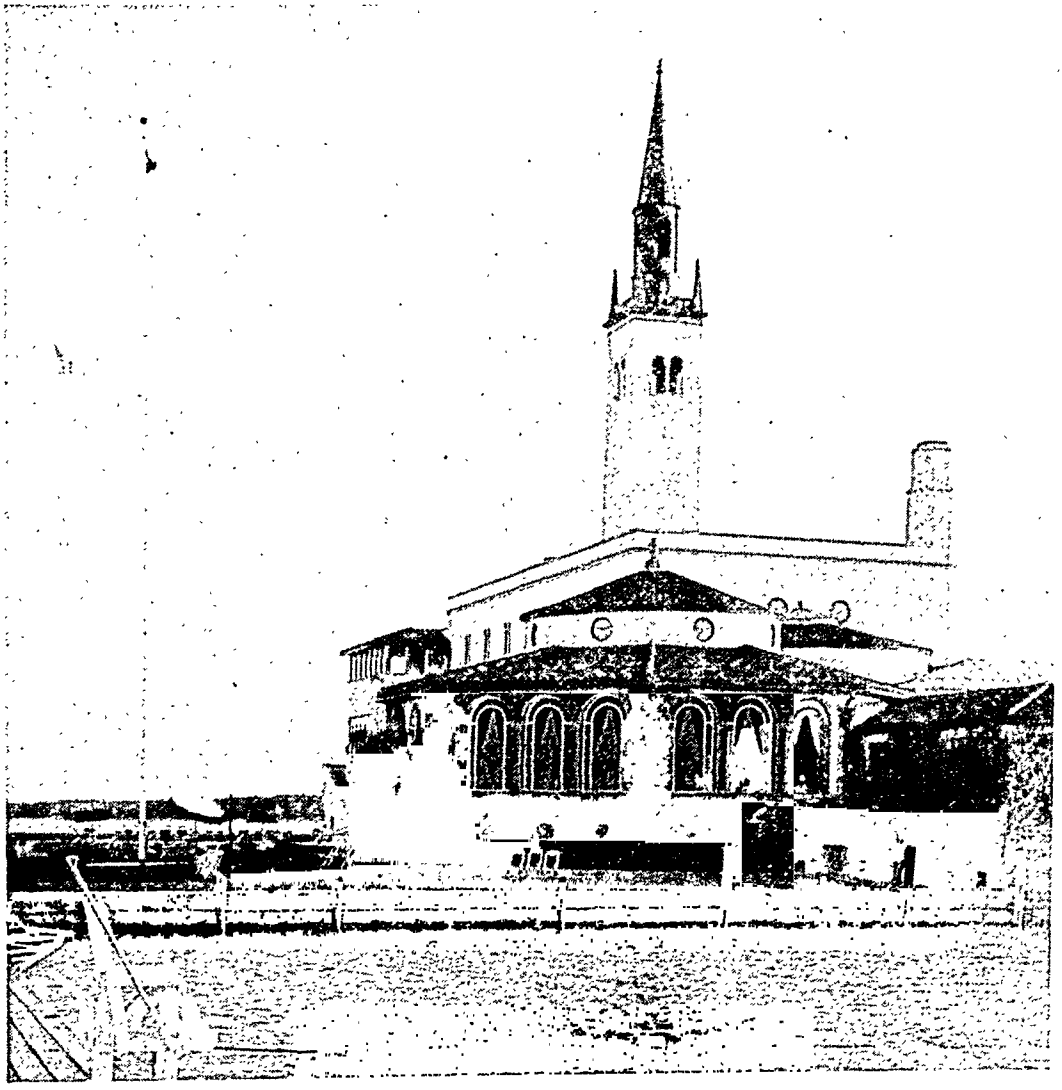
Radio Station WWJ Studios

possible through the courtesy of Radio Station WWJ and its manager, Mr. William J. Scripps. A speaker of nation-wide importance will complete the program.

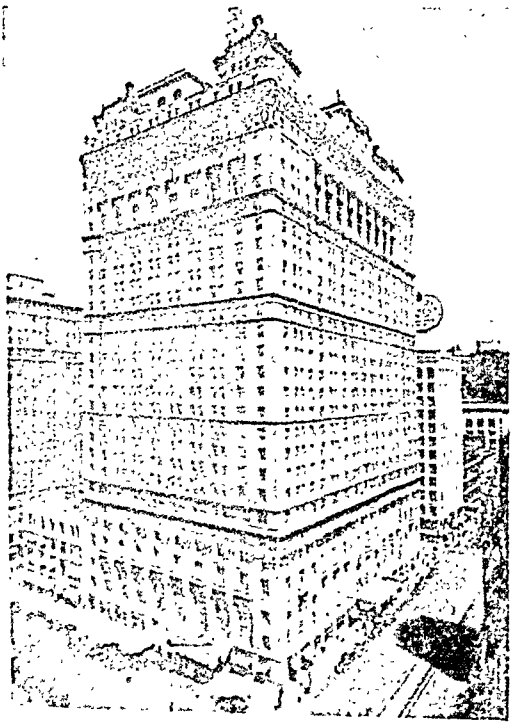
The Annual Banquet, which will be held in the Grand Ballroom of Hotel Statler, will be followed by features which will include the presentation of diplomas to those persons who at one time were members of the staff of the Detroit Department of Health and who have gone on to other fields of endeavor in public health. Dancing will follow the dinner.

Arrangements have been made for busses to be available to take groups to River Rouge to the factory of the Ford Motor Company and to that of the Plymouth Division of the Chrysler Corporation. In addition the Chrysler Corporation is promising a trip for the ladies who attend the meeting to their main plant.

Various organizations in Detroit interested in public health and child welfare have arranged for inspection visits and teas for those who are particularly interested in specific activities. Information may be obtained at the



Grosse Pointe Yacht Club



Book-Cadillac Hotel

Association desk regarding these points of interest, and appointments will be made for those who care to visit these institutions.

There are any number of good restaurants in Detroit within walking distance of the downtown hotels, and the largest theaters are situated in the same immediate vicinity. Radio Station WWJ invites members to visit their studios and be present at broadcasts. One session of the Public Health Education Institute on radio will be held in the WWJ studios.

Arrangements for golf privileges have been made with local golf clubs, and for those who wish to run around nine short holes the course at Belle Isle can be covered in a little more than an hour. There are churches of various denominations close to the hotels for those who arrive early and wish to attend services on Sunday morning.



Radio Station WWJ Transmitting Station

Comparative Study of the Bacterial Flora of Grade A and Grade B Milk in New York City

M. L. ISAACS, PH.D., AND M. NUSSBAUM, M.S.

DeLamar Institute of Public Health, Columbia University, New York, N. Y.

SUPPLEMENT TO THE AMERICAN JOURNAL OF PUBLIC HEALTH, SEPTEMBER, 1940

Comparative Study of the Bacterial Flora of Grade A and Grade B Milk in New York City

M. L. ISAACS, PH.D., AND M. NUSSBAUM, M.S.

DeLamar Institute of Public Health, Columbia University, New York, N. Y.

THE proposal to abolish the grading of milk in New York City has raised the fundamental question, namely, "Is the continuance of the Grade A specifications with their accompanying extra precautions in sanitation and handling justified on public health or other considerations in view of their necessarily higher cost?" Any attempt to answer this question requires that a comparison be made of Grade A and Grade B milks, particularly from the point of view of their content of bacteria both in number and kinds. To supply the data needed for such a comparison, a study was undertaken by the DeLamar Institute of Public Health at the invitation of the Grade A Milk Association with funds provided by that organization. The work was begun in April, 1939, and was continued until the middle of March, 1940.

A study of somewhat similar nature was made for the Grade A Committee of Metropolitan New York by Dr. Walter L. Carr with the coöperation of a number of authorities on milk control.[1] In addition, to inspections of farms and receiving stations, tests were made on samples of milk for (1) Standard Methods counts (agar and Breed method), (2) coliform organisms in pasteurized milk, (3) streptococci in raw milk, (4) sediment test, and (5) Babcock test for fat. Farm inspections were made for the study by the late Dr. William H. Park who reported that "there is a very great difference in the average between conditions on the Grade A and Grade B farms. The Grade A farms rate much higher in cleanliness and in the handling of cows and milk." The Standard Methods counts showed that just before pasteurization Grade B raw milk contains on the average 6 times as many organisms per cc. as the Grade A milk, and after pasteurization 9 times as many as Grade A pasteurized. Hemolytic streptococci were commonly isolated, but human strains were not found in either milk. Coliform-positive samples were found twice as frequently among the Grade B pasteurized samples as among the Grade A pasteurized samples.

Our own study, reported below, was concerned solely with the bacterial flora of the two milks. After the publication of the Carr report a new medium for the Standard Methods count was adopted by the American Public Health Association. This made it desirable to restudy the comparative Standard Methods counts of the two milks. Streptococci were determined in both pasteurized and raw milks. For our coliform studies, which were made on both raw and pasteurized samples,

ASSOCIATION NEWS

SIXTY-NINTH ANNUAL MEETING

DETROIT, MICH., OCTOBER 8–11, 1940

HEADQUARTERS

Book-Cadillac Hotel and Hotel Statler

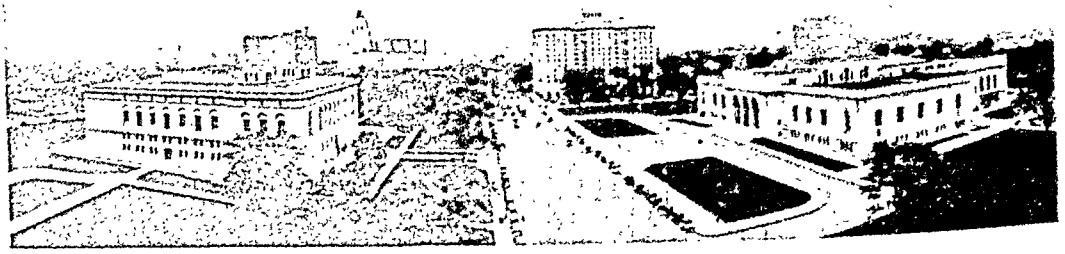
RAILROAD FARES FROM VARIOUS POINTS TO DETROIT, MICH.

AMERICAN PUBLIC HEALTH ASSOCIATION

OCTOBER 8–11, 1940

From	*One-way Pullman Travel*	*Round trip Pullman Travel*	*One-way Lower*	*One-way Upper*
Atlanta, Ga.	$22.24	$36.40	$5.80	$4.40
Baltimore, Md.	18.00	33.70	4.50	3.10
Boston, Mass.	23.30	42.75	5.25	3.60
Buffalo, N. Y.	8.40	15.10	2.10	1.45
Chicago, Ill.	8.55	16.65	2.65	1.80
Cleveland, Ohio	4.90	9.65	2.65	1.80
Dallas, Tex.	34.92	56.35	8.95	6.80
Denver, Colo.	39.61	63.25	9.45	7.20
Duluth, Minn.	21.85	37.20	5.25	4.00
Fort Worth, Tex.	34.92	56.35	8.95	6.80
Indianapolis, Ind.	8.05	15.70	2.65	1.80
Jacksonville, Fla.	32.42	51.80	8.40	6.40
Kansas City, Mo.	22.33	37.35	5.25	4.00
Louisville, Ky.	11.20	20.80	3.15	2.20
Los Angeles, Calif.	74.71	106.95	18.90	14.40
Memphis, Tenn.	22.40	37.30	5.80	4.40
Milwaukee, Wis.	11.10	20.50	3.20 *	2.35 *
Minneapolis, Minn.	20.39	35.00	4.50	3.40
Nashville, Tenn.	17.01	28.60	5.30	3.80
New Orleans, La.	32.90	52.85	8.40	6.40
New York, N. Y.	21.50	39.75	4.50	3.10
Omaha, Nebr.	23.11	39.10	5.80	4.40
Philadelphia, Pa.	19.40	36.25	4.50	3.10
Pittsburgh, Pa.	8.85	17.25	2.65	1.80
Portland, Ore.	72.89	106.95	18.40	14.00
Salt Lake City, Utah	53.34	76.45	13.40	10.20
San Francisco, Calif.	74.71	106.95	18.90	14.40
Seattle, Wash.	72.89	106.95	18.40	14.00
St. Louis, Mo.	14.90	26.30	3.15	2.20
Washington, D. C.	18.00	33.70	4.50	3.10
Montreal, Que.	19.25	34.65	4.20	2.90
Halifax, N. S.	40.60	69.25	8.95	6.70
Ottawa, Ont.	16.25	29.25	4.10	3.05
Quebec, P. Q.	24.90	44.80	6.20	4.50
Toronto, Ont.	7.75	13.95	2.10	1.45
Vancouver, B. C.	72.89	106.95	19.20	14.60

* Seat to Chicago



Detroit Art Center

DETROIT HOTELS

Hotel	Room Capacity	Single Room: Without Bath	Single Room: With Bath	Double Room: Without Bath	Double Room: With Bath
Abington	336		$3.00 up		$4.00–$5.00
Barlum	800		2.00 "		3.00– 4.00
Belcrest	400		3.00 "		4.00– 5.00
Book-Cadillac	1,200		3:00 "		5.00– 6.00
Briggs	200		2.00 "		3.00– 4.00
Detroit Leland	800		2.50 "		4.00– 5.00
Fairbairn	400	$1.25	2.50 "	$2.50	3.00– 3.50
Fort Shelby	900		2.50 "		4.00– 5.00
Imperial	200		2.00 "		2.50– 3.50
Lee Plaza	475		3.00 "		5.00– 6.00
Norton	250	1.25	2.00 "	$2.50–$2.75	3.00– 4.00
Palmetto	324		2.50 "		4.00– 5.00
Prince Edward, Windsor	250		2.50 "		4.00– 5.00
Savarine	500	1.50	2.25 "	$2.50	3.25– 5.00
Statler	1,000		3.00 "		5.00– 5.50
Tuller	800		2.00 "		3.50– 4.50
Wardell	650		3.00 "		4.50– 5.50
Webster Hall	800	1.50	2.00 "	2.50	3.50– 4.00
Whittier	850		3.00 "		4.50– 5.00
Wolverine	500		1.50 "		2.50– 4.00

.....(Cut off on this line and mail to the hotel of your choice).....

HOTEL RESERVATION BLANK FOR THE DETROIT MEETING AMERICAN PUBLIC HEALTH ASSOCIATION, OCTOBER 8–11, 1940

To
(Name of Hotel)

Please reserve for me rooms for persons for the A.P.H.A. Meeting.

Single room Double room

Maximum rate per day for room $..... Minimum rate per day for room $.....

I expect to arrive If date of arrival is changed I will notify you at least 24 hours in advance.

Please acknowledge this reservation.

Name

Street address

City State

APPLICANTS FOR MEMBERSHIP

The following individuals have applied for membership in the Association. They have requested affiliation with the sections indicated.

Health Officers Section

Charles G. Baker, M.D., 212 N. Upper, Lexington, Ky., Assistant Health Officer, Fayette County Health Dept.

Frederick F. Brown, M.D., M.P.H., St. Mary Parish Health Center, Franklin, La., Deputy Health Officer

John M. Byers, M.D., 15½ Ralston Ave., Hyattsville, Md., Assistant County-Deputy Health Officer, Prince George's County Health Dept.

Glen W. McDonald, M.D., M.P.H., 1124 East Eighth, Ada, Okla., Director, City-County Health Unit

Louis G. Moench, M.D., City and County Bldg., Provo, Utah, Deputy State Health Commissioner

Lailor A. Morrogh, M.D., Avoyelles Health Unit, Marksville, La., Director

Benjamin B. Robbins, M.D., 47 Main St., Bristol, Conn., City Health Officer

Laboratory Section

Walter J. Beichert, M.D., 302 Ashland Place, Brooklyn, N. Y., Charge of Orthopedic Dept. and Laboratory Work, Lindsay Laboratories

Joseph P. Cleary, M.D., City Hall, Portland, Ore., Director of Laboratories, Bureau of Public Health

William W. Ferguson, M.S., Bureau of Laboratories, State Health Dept., Lansing, Mich., Senior Bacteriologist

Mary K. Gurley, Berkeley Inn, Haste at Telegraph Ave., Berkeley, Calif., Bacteriologist, Sonoma County Health Dept.

George F. Ilg, M.Sc., 1325 Potrero Ave., San Francisco, Calif., Field and Laboratory Work, Borden's Dairy Delivery Company

Clifford B. Line, D.V.M., Bureau of Laboratories, State Health Dept., Lansing, Mich., Assistant Director

Albert W. Morriss, M.A., City-County Health Dept., Tyler, Tex., Chief Technician, Malarial Investigation Division, State Health Dept.

Mary Nimlos, B.A., Rm. 606 City Hall, Milwaukee, Wis., Senior Bacteriologist, Health Dept.

John W. Shiel, 94–11 Springfield Blvd., Queens Village, L. I., N. Y., Director, Shiel Laboratory

Julia C. Sullivan, A.B., 82 Arlington St., Haverhill, Mass., Laboratory Technician, Health Dept.

Vital Statistics Section

Marion F. Cure, 1954 Grand Ave., St. Paul, Minn., Statistician, State Dept. of Health

Helen H. Dahl, 312 City Hall, Atlantic City, N. J., Acting Registrar, Dept. of Health

Doris L. Duxbury, B.A., Mayo Clinic, Rochester, Minn., Statistician for Morbidity Report for Mayo Clinic and Hospitals

Mary S. Edwards, B.A., Rm. 922, 50 West 50 St., New York, N. Y., Statistician and Assistant Director, American Social Hygiene Assn.

Stanley G. Hanks, M.S., C.P.H., 2302 Van Lennen Ave., Cheyenne, Wyo., Director, Bureau of Vital Statistics, State Dept. of Health

Irene C. Haviland, 24 Myrtle Ave., Newark, N. J., Assistant Statistician, New York Tuberculosis and Health Assn.

W. G. Johnson, A.B., Rm. 960, 20 N. Wacker Drive, Chicago, Ill., Chief Statistician, National Safety Council

Ella A. Mead, M.D., Coronado Blk., Greeley, Colo., Registrar of Vital Statistics, Wild County

Florence E. Olson, A.B., 1215½ West Adams St., Phoenix, Ariz., Vital Statistician, State Board of Health

Pearce Shepherd, Ph.B., Prudential Insurance Co., Newark, N. J., Assistant Actuary

Alba B. Smith, R.N., 509 N. E. 64 St., Miami, Fla., Deputy Registrar and Statistician, Bureau of Vital Statistics, Health Dept.

Engineering Section

John E. Brewer, B.S.A.E., City Health Dept., 105 Courthouse, Memphis, Tenn., Junior Engineer

William J. Dixon, B.S. in C.E., 2300 McCoy St., Kansas City, Mo., Sanitary Engineer, Health Dept.

Henry Greene, M.S.P.H., 152 Rust Ave., Big Rapids, Mich., Sanitarian, Mecosta-Osceola Health Dept.

Ralph R. Hobbs, 1324 N. Euclid, Tucson, Ariz., Sanitarian, Pima County Health Dept.

Alfred E. Regelsen, B.S. in C.E., 547 Cauldwell Ave., New York, N. Y., Junior Sanitary Engineer, New York State Conservation Dept.

Leonard O. Williams, Jr., M.S., State Health Dept., Cheyenne, Wyo., State Sanitary Engineer

Lawrence E. Wood, B.S. in C.E., 425 Locust St., Marion, Kans., Sanitary Engineer, Marion County Health Dept.

Industrial Hygiene Section

Starling D. Steiner, M.D., M.P.H., Brooke County Health Dept., Wellsburg, W. Va., Health Officer

Commander Charles S. Stephenson, M.D., 4457 Que St., N.W., Washington, D. C., In Charge, Division of Preventive Medicine, Navy Dept.

Elmer P. Wheeler, B.S. in Chem., 12 Park St., Concord, N. H., Industrial Hygiene Engineer, State Board of Health

Food and Nutrition Section

Franklin A. Clark, D.V.M., 519 Dexter Ave., Montgomery, Ala., Director, Division of Inspection, State Health Dept.

Dorothy B. Hacker, M.A., 51 W. Warren Ave., Detroit, Mich., Nutritionist, Visiting Nurse Assn.

Helen A. Hunscher, Ph.D., 2023 Adelbert Rd., Cleveland, Ohio, Head, Home Economics Dept., Western Reserve University

Kenneth R. Lennington, B.A., 416 Federal Annex, Atlanta, Ga., Junior Food and Drug Inspector, U. S. Food and Drug Administration

William C. Moeser, A.B., 605 K. St., National City, Calif., San Diego County Food Inspector

Jane Sedgwick, B.Sc., 2338–20th Ave., San Francisco, Calif., Home Economist, Bureau of Child Hygiene, Dept. of Public Health

Maternal and Child Health Section

Harriet B. Farnham, M.D., 877 West Mountain St., Glendale, Calif., Physician, Maternal and Child Hygiene Division, Los Angeles County Health Dept.

John L. Gedgoud, M.D., University Hospital, 42 & Dewey, Omaha, Nebr., Pediatrician, Bureau of Maternal and Child Health, State Health Dept.

Christie A. Thompson, R.N., 12 Fordonia Bldg., Reno, Nev., Supervisory Nurse, State Dept. of Health

Public Health Education Section

Marie E. Cantin, 4642 St. Denis, Montreal, Que., Canada, Head Nurse, Metropolitan Life Insurance Co.

Helen Crosby, A.B., 330 Fourth Ave., New York, N. Y., Chief, Bureau of Social and Health Agencies, Metropolitan Life Insurance Co.

Pirkey Forster, Rt. 5, Box 62, Bakersfield, Calif., Director of Public Health Education, Kern County Health Dept.

Raymond Howe, D.D.S., Cody, Wyo., Member, State Board of Health

Henry Pleasants, Jr., M.D., 18 West Chestnut St., West Chester, Pa., Medical Director, State Teachers College

Josephine B. Weills, B.A., 30 Keene Way, Medford, Ore., President, Jackson County Public Health Assn.

J. Kenneth Winter, P.D., 2117 Peach St., Erie, Pa., Executive Secretary, Erie County Health and Tuberculosis Assn.

Public Health Nursing Section

Flora H. Booth, R.N., 715 West Market St., Akron, Ohio, Director, Nursing Division, Summit County Health Dept.

Milenka Herc, 51 West Warren, Detroit, Mich., Mental Hygiene Consultant and Assistant Director, Detroit Visiting Nurse Assn.

Frances M. Hersey, M.A., State Health Dept., Cheyenne, Wyo., Supervisory Nurse

Margaret L. Howe, B.S., Gilman, Ill., District Public Health Nurse

Harriette L. Hunter, R.N., 788 E. Walnut, Springfield, Mo., Public Health Nurse, Greene County Health Dept.

Lenna G. Longdon, R.N., 1 Madison Ave., New York, N. Y., Territorial Supervisor, Metropolitan Life Insurance Co.

Marjorie F. McVey, R.N., 100 East Second Ave., Cheyenne, Wyo., Physical Therapist, State Dept. of Public Health

Alberta M. Trunck, B.S., Barnert Memorial Hospital, Paterson, N. J., Director, School of Nursing

Ruby E. Wood, R.N., State Dept. of Health, Albany, N. Y., Consultant Public Health Nurse, Division of Maternity and Child Health

Epidemiology Section

Margaret W. Baggett, R.N., P. O. Box 371, Montgomery, Ala., Special Nurse, Tuberculosis Studies, U. S. Public Health Service

O. Merton Derryberry, M.D., M.P.H., Wilson Dam, Ala., Epidemiologist, Tennessee Valley Authority

Clarence R. Letteer, Jr., M.D., 102 Dwyer, San Antonio, Tex., Epidemiologist, Health Dept.

Richard Nauen, M.D., New York State Hospital, Ray Brook, N. Y., Senior Tuberculosis Hospital Physician

Gerald J. Sylvain, M.D., M.S.P.H., 311 West 3 St., Carson City, Nev., State Epidemiologist, State Health Dept.

Robert S. Westphal, M.D., Box 177, Batavia, N. Y., Special Consultant, U. S. Public Health Service

William H. Wolfram, M.D., 1505 Fountain

Square Bldg., Cincinnati, Ohio, Medical Adviser to Chinese Government

Unaffiliated

John V. Ambler, M.D., 910 Republic Bldg., Denver, Colo., Director, City Venereal Disease Clinic

Helen E. Conger, M.S.P.H., R.N., 241 Madison Ave., Grand Rapids, Mich., Graduate Student, Univ. of Michigan

Charles F. Good, M.D., 11333 Hessler Rd., Cleveland, Ohio, Directing Supervisor, Medical Inspection, Board of Education

Samuel F. Jenkins, M.D., M.S.P.H., 35-13-103 St., Corona, L. I., N. Y., Special Worker (WPA), Bureau of Social Hygiene, New York City Dept. of Health

Jean B. R. Koupal, M.D., M.S.P.H., 303 East 161 St., New York, N. Y., Physician, Health Dept.

J. L. Swigert, M.D., Republic Bldg., Denver, Colo.

APPLICANTS FOR FELLOWSHIP

In accordance with the By-laws of the Association, the names of applicants for Fellowship are officially published herewith. They have requested affiliation with the Sections indicated. Action by the various Section Councils, the Committee on Eligibility and the Governing Council will take place between now and the Detroit Annual Meeting.

Health Officers Section

Richard M. Adams, M.D., M.P.H., Superintendent of Health, Tulsa, Okla.

Harry S. Allen, M.D., Health Commissioner, Ironton, Ohio

Albert C. Baxter, M.D., Director, State Health Department, Springfield, Ill.

Charles F. Blankenship, M.D., M.P.H., P. A. Surgeon, U. S. Public Health Service, San Francisco, Calif.

Walter H. Bruce, M.D., Director, Jefferson County Health Unit, Pine Bluff, Ark.

Frank A. Calderone, M.D., M.P.H., District Health Officer, Department of Health, New York, N. Y.

Frank M. Carroll, M.D., Commissioner of Health, Seattle, Wash.

Charles D. Cawood, M.D., M.P.H., City of Lexington and Fayette County Health Officer, Lexington, Ky.

Robert L. Cherry, M.D., M.P.H., Director, Tyler-Smith County Health Unit, Tyler, Tex.

Roy L. Cleere, M.D., C.P.H., Secretary and Executive Officer, State Board of Health, Denver, Colo.

John E. Dunn, M.D., M.S.P.H., P. A. Surgeon, U. S. Public Health Service, Washington, D. C.

Cecil R. Fargher, M.D., M.P.H., Health Officer, Clark County-City Health Dept., Vancouver, Wash.

Robert E. Fox, M.D., M.P.H., Director of County Health Work, State Board of Health, Raleigh, N. C.

John D. Fuller, M.D., C.P.H., Santa Cruz County and City Health Officer, Santa Cruz, Calif.

Eugene A. Gillis, M.D., M.P.H., Epidemiologist and Venereal Disease Consultant, State Health Department, Oklahoma City, Okla.

Lloyd M. Graves, M.D., Superintendent of Health, Memphis, Tenn.

Charles C. Hedges, M.D., City-County Health Officer, Savannah, Ga.

Robert D. Higgins, M.D., M.P.H., Director of Health, Boyd County Health Department, Ashland, Ky.

Ernest E. Huber, M.D., M.P.H., Commissioned Officer, U. S. Public Health Service, Washington, D. C.

Frederick W. Kratz, M.D., P. A. Surgeon, U. S. Public Health Service, New York, N. Y.

Arthur E. Lien, M.D., Spokane County Health Officer, Spokane, Wash.

Burdge P. MacLean, M.D., Deputy Commissioner, Suffolk County Department of Health, Huntington, L. I., N. Y.

Elroy F. McIntyre, M.D., C.P.H., Director of Venereal Disease Control, State Health Department, Santa Fe, N. M.

Wallace S. Petty, M.D., Director, Woodbury County Health Service, Sioux City, Ia.

Carl V. Reynolds, M.D., Secretary and State Health Officer, State Board of Health, Raleigh, N. C.

John W. Shackelford, M.D., M.P.H., Director, Local Health Service, State Health Department, Oklahoma City, Okla.

Raymond A. Vonderlehr, M.D., Assistant Surgeon General in Charge, Division of Venereal Diseases, U. S. Public Health Service, Washington, D. C.

Ragnar T. Westman, M.B., M.D., Dr.P.H., Director of Health, Kansas City, Kans.

Laboratory Section

Gerard Laviano, M.D., Director, Woodside Medical Laboratory, Woodside, L. I., N. Y.

S. Edward Sulkin, Ph.D., Senior Bacteriologist, Health Department, St. Louis, Mo.

Industrial Hygiene Section

Paul A. Brehm, M.D., Supervisor, Industrial Hygiene, State Board of Health, Madison, Wis.

Arbie L. Brooks, M.D., Medical Director, Fisher Body Division, General Motors Corporation, Detroit, Mich.

J. William Fehnel, B.S., Chemist in Charge of Industrial Hygiene Laboratory, Metropolitan Life Insurance Company, New York, N. Y.

William B. Fulton, M.D., M.P.H., Chief of Industrial Hygiene, State Health Department, Harrisburg, Pa.

Leroy U. Gardner, M.D., Director, Trudeau Foundation, Saranac Lake, N. Y.

Don D. Irish, Ph.D., Director, Biochemical Research Laboratory, Dow Chemical Company, Midland, Mich.

Willard Machle, M.D., Assistant Director, Kettering Laboratory, University of Cincinnati, Cincinnati, O.

Carl A. Nau, M.D., Director, Division of Industrial Hygiene, State Health Department, Austin, Tex.

Paul A. Neal, M.D., Acting Chief, Division of Industrial Hygiene, National Institute of Health, U. S. Public Health Service, Bethesda, Md.

Richard T. Page, M.S. in S.E., Associate Public Health Engineer, U. S. Public Health Service, Bethesda, Md.

John P. Russell, M.D., C.P.H., Chief, Industrial Hygiene Service, State Health Department, Berkeley, Calif.

Helmuth H. Schrenk, Ph.D., Chief Chemist, Health Division, U. S. Bureau of Mines, Pittsburgh, Pa.

Herbert T. Walworth, M.S., Industrial Engineer, State Department of Health, Helena, Mont.

Stephen E. Whiting, S.B. in E.E., Vice-President and Consulting Engineer, Liberty Mutual Insurance Company, Boston, Mass.

Constantin P. Yaglou, M.M.E., Associate Professor of Industrial Hygiene, Harvard School of Public Health, Boston, Mass.

William P. Yant, B.S., Director of Research, Mine Safety Appliances Company, Pittsburgh, Pa.

Food and Nutrition Section

Morris Ant, M.D., Chief Nutritionist, Beth-El Hospital, Brooklyn, N. Y.

James O. Clarke, B.S., Chief, Central District, U. S. Food and Drug Administration, Chicago, Ill.

Bion R. East, D.D.S., Research Associate, Delafield Institute of Public Health, Columbia University, New York, N. Y.

Harry E. Goresline, Ph.D., Senior Bacteriologist, U. S. Department of Agriculture, Washington, D. C.

Marjorie M. Heseltine, M.A., Specialist in Nutrition, U. S. Children's Bureau, Washington, D. C.

Lloyd B. Jensen, Ph.D., Chief Bacteriologist, Swift & Company Research Laboratories, Chicago, Ill.

John A. Keenan, Ph.D., Director of Sanitation and Quality, Whiting Milk Co., Newton Centre, Mass.

Charles G. King, Ph.D., Professor of Food, Sanitary and Biological Chemistry, University of Pittsburgh, Pittsburgh, Pa.

Leland S. McClung, Ph.D., Assistant Professor of Bacteriology, Indiana University, Bloomington, Ind.

Margaret C. Moore, M.S., Consultant in Nutrition, State Board of Health, New Orleans, La.

Carl S. Pederson, Ph.D., Chief in Research, New York State Agricultural Experiment Station, Geneva, N. Y.

Paul S. Prickett, Ph.D., Chief Bacteriologist, Mead Johnson & Company, Evansville, Ind.

Lewis Radcliffe, Sc.D., Director, The Oyster Institute of North America, Washington, D. C.

Joseph R. Sanborn, Ph.D., In Charge of Paper Sanitation Research, New York State Agricultural Experiment Station, Geneva, N. Y.

Cecilia Schuck, Ph.D., Assistant Professor of Nutrition, Purdue University, Lafayette, Ind.

William H. Sebrell, Jr., M.D., Surgeon, U. S. Public Health Service, Bethesda, Md.

Eleanor F. Wells, M.A., Director, School of Homemaking, Y.W.C.A., Providence, R. I.

William R. M. Wharton, M.A., Chief, Eastern District, U. S. Food and Drug Administration, New York, N. Y.

Maternal and Child Health Section

Leona Baumgartner, M.D., Ph.D., Director of Public Health Training, Department of Health, New York, N. Y.

Jessie M. Bierman, M.D., Assistant Director, Maternal and Child Health Division, U. S. Children's Bureau, Washington, D. C.

James W. Chapman, M.D., Director, Division of Child Hygiene, State Health Department, Jefferson City, Mo.

Martha L. Clifford, M.D., C.P.H., Director, Bureau of Child Hygiene, State Health Department, Hartford, Conn.

Samuel McC. Hamill, M.D., President, Phila-

delphia Child Health Society, Philadelphia, Pa.

Henry Klein, D.D.S., Sc.D., Dental Officer, National Institute of Health, U. S. Public Health Service, Bethesda, Md.

Ruth M. Strang, Ph.D., Associate Professor of Education, Teachers College, Columbia University, New York, N. Y.

Engineering Section

Roy J. Boston, C.E., Associate Engineer, Typhus Control, State Health Department, Macon, Ga.

Graham McF. Hatch, Jr., M.S. in S.E., Sanitary Engineer, Health Department, Dallas, Tex.

John M. Hepler, C.E., Assistant Engineering Director, Bureau of Industrial Hygiene and Associate Director, Bureau of Engineering, State Health Department, Lansing, Mich.

Public Health Education Section

Philip S. Broughton, A.B., Senior Editor-Writer, Social Security Board, Washington, D. C.

Clifford L. Brownell, Ph.D., Professor of Physical Education, Teachers College, Columbia University, New York, N. Y.

Mrs. Beulah France, Health Educator, New York, N. Y.

Edith M. Gates, B.S., Health Education Director, National Board, Y. W. C. A., New York, N. Y.

Bruno F. W. Gebhard, M.D., Director, Cleveland Museum of Health and Hygiene, Cleveland, O.

Embree G. Jaillite, A.B., Director of Publicity, Public Health Committee of Cup and Container Institute, New York, N. Y.

Earl E. Kleinschmidt, M.D., Dr.P.H., Director, Department of Preventive Medicine, Public Health and Bacteriology, Loyola University Medical School, Chicago, Ill.

Nina B. Lamkin, M.A., School Health Consultant, State Health Department, Santa Fe, N. M.

Carl O. Lathrop, Ph.D., Executive Secretary, Tuberculosis and Health Association of Niagara County, Lockport, N. Y.

Hugh R. Leavell, M.D., Director of Health, Louisville Health Department and Professor of Public Health, University of Louisville Medical School, Louisville, Ky.

Charles H. Lerrigo, M.D., Executive Secretary, Kansas Tuberculosis and Health Association, Topeka, Kans.

Howard W. Lundy, Dr.P.H., Assistant Professor of Bacteriology and Public Health, Washington State College, Pullman, Wash.

Meta P. Newman, Editor, The Trained Nurse and Hospital Review, New York, N. Y.

Robert G. Paterson, Ph.D., Executive Secretary, Ohio Public Health Association, Columbus, O.

Ella H. Rigney, Director of Public Relations, New York City Cancer Committee, New York, N. Y.

Arthur J. Strawson, B.S., Secretary, Massachusetts Tuberculosis League, Boston, Mass.

Israel Weinstein, M.D., Sc.D., Ph.D., Assistant Director, Bureau of Health Education, Department of Health, New York, N. Y.

Public Health Nursing Section

Mary I. Mastin, R.N., B.S., Director, Public Health Nursing, State Health Department, Richmond, Va.

Anna R. Moore, R.N., State Advisory Nurse, State Department of Health, Seattle, Wash.

Rosalie I. Peterson, B.S., Associate Public Health Nursing Consultant, U. S. Public Health Service, Washington, D. C.

Fannie T. Warncke, Director of Public Health Nursing, State Health Department, Santa Fe, N. M.

Mattie M. Washburn, R.N., Assistant Director, Division of Public Health Nursing, State Department of Health, Albany, N. Y.

Epidemiology Section

Eugene W. Bogardus, M.D., C.P.H., Superintendent, Onondaga Sanatorium, Syracuse, N. Y.

John J. Bourke, M.D., M.P.H., Research Director, New York State Temporary Legislative Commission to Formulate a Long Range State Health Program, Albany, N. Y.

William A. Brumfield, Jr., M.D., C.P.H., Director, Division of Syphilis Control, State Department of Health, Albany, N. Y.

Harry L. Chant, M.D., M.P.H., District Health Officer, State Department of Health, Middletown, N. Y.

William T. Clark, M.D., Dr.P.H., Associate Professor of Hygiene and Public Health, University of Buffalo Medical School, Buffalo, N. Y.

W. Palmer Dearing, M.D., Commissioned Officer, U. S. Public Health Service, Montgomery, Ala.

Charles H. Halliday, M.D., Chief, Bureau of Communicable Diseases and Epidemiology, State Department of Health, Baltimore, Md.

Edward M. Holmes, Jr., M.D., M.P.H., Director, Division of Venereal Disease Control, State Health Department, Richmond, Va.

Hollis S. Ingraham, M.D., M.P.H., District State Health Officer, State Department of Health, Albany, N. Y.

Paul A. Keeney, M.D., M.P.H., Chief, Division of Epidemiology, State Department of Health, Harrisburg, Pa.

Edward A. Lane, M.D., M.P.H., Director, Division of Communicable Diseases, Westchester County Department of Health, White Plains, N. Y.

Charles F. McKhann, Jr., M.D., Professor of Pediatrics and Communicable Diseases, and Chairman, Department of Pediatrics and Communicable Diseases, University of Michigan, Ann Arbor, Mich.

Philip J. Rafle, M.D., M.P.H., District State Health Officer, State Department of Health, Syracuse, N. Y.

Edward S. Rogers, M.D., M.P.H., Director, Bureau of Pneumonia Control, State Department of Health, Albany, N. Y.

Charles E. Smith, M.D., D.P.H., Associate Professor of Public Health and Preventive Medicine, Stanford University, Calif.

Thomas B. Turner, M.D., Professor of Bacteriology, Johns Hopkins School of Hygiene, Baltimore, Md.

Leslie T. Webster, M.D., Member, The Rockefeller Institute for Medical Research, New York, N. Y.

Unaffiliated

Justin M. Andrews, D.Sc., Director, Malaria Investigations Service, State Department of Health, Decatur, Ga.

Jack G. Baker, Chief, Bureau of Foods and Drugs, Department of Public Health, San Diego, Calif.

Charles D. Bowdoin, M.D., M.P.H., Director, Division of Preventable Diseases, State Department of Health, Atlanta, Ga.

Guillermo Lage y Fernandez, M.D., C.P.H., Assistant Director, Section of Scientific Investigations, Finlay Institute, Havana, Cuba.

Leon A. Fox, M.D., Dr.P.H., Ph.D., Professor of Preventive Medicine, University of Michigan Medical School, Ann Arbor, Mich.

Francis C. Lawler, Sc.D., Assistant Professor of Bacteriology and Public Health, University of Oklahoma, Oklahoma City, Okla.

Theodore R. Meyer, M.D., Dr.P.H., Health Commissioner, St. Louis, Mo.

Joseph G. Molner, M.D., M.P.H., Director, School Health Service, Department of Health, Detroit, Mich.

Lowell S. Selling, M.D., Dr.P.H., Ph.D., Director, Psychopathic Clinic of the Recorder's Court, Detroit, Mich.

Henry H. Smach, Ph.D., Director, Suburban Laboratories, Inc., Cicero, Ill.

HEALTH CONSERVATION CONTEST HONOR ROLL FOR SYPHILIS AND TUBERCULOSIS

THE Chamber of Commerce of the United States and the American Public Health Association announce that in connection with the 1940 City Health Conservation Contest, eligible cities may qualify for the Honor Roll for noteworthy achievement in the fields of tuberculosis and syphilis control.

Any city enrolled in the regular Contest is eligible for placement on *either or both* the syphilis and the tuberculosis Honor Rolls.

These Honor Rolls are being set up in the belief that some cities may have particularly effective programs in some special field even though their entire programs may not be of an equally high standard.

Application blanks for the Health Conservation Contest Honor Rolls for syphilis and tuberculosis may be obtained from either the American Public Health Association or the Chamber of Commerce of the United States. The syphilis and tuberculosis questionnaires will be forwarded upon receipt of a filled out application blank. For further particulars, write to the American Public Health Association, 50 West 50th Street, New York, N. Y.

EMPLOYMENT SERVICE

The Association Employment Service seeks to bring to the attention of appointing officers the names of qualified public health personnel and to act as a clearinghouse on employment. This is a service of the Association conducted without expense to employer or employee.

From the registry of persons available, selected announcements are published from time to time. Appointing officers may obtain lists of all registrants on request.

Positions Available

Experienced bacteriologist and serologist (female) to direct and supervise serum preparation in a large institution. **W464**

The Municipal Civil Service Commission of the City of New York makes announcement of an examination for Assistant Engineer (Designer), Grade 4, Board of Water Supply. This will be open to all qualified citizens of the United States, and will be held in New York, Boston, and Knoxville. Salary $3,120 per annum, and upward. Closing date for applications: September 23, 1940. Write: Municipal Civil Service Commission, 299 Broadway, New York, N. Y.

Positions Wanted

ADMINISTRATIVE

Unusually well trained physician, Dr.P.H., Harvard, background of laboratory research and experimental epidemiology, wishes opportunity to acquire field administrative experience under good auspices. **A460**

Physician, with Dr.P.H. degree, who has had 6 years' experience as public health administrator, seeks administrative position in full-time city or city-county health department. **A367**

Physician, M.P.H., Harvard, a student of maternal problems, wishes position preferably with teaching opportunities. **A461**

Physician, 32; M.D., 1936; postgraduate course in venereal disease control, experienced as district health officer and in organizing and publicizing syphilis control campaign; now employed in charge venereal disease clinics in metropolitan health department; seeks venereal disease control post with opportunity to organize or administer program. **A437**

Well qualified physician, with M.P.H. from Johns Hopkins, and experienced as county health officer, and now assistant health officer in a large city, will consider county or city administrative position. **A383**

Physician, M.P.H., Harvard; well experienced in city and rural health administration, will consider appointment as district health officer or in city or state health department. **A418**

HEALTH EDUCATION

Young woman with splendid educational background, graduate of M.I.T. health education courses; M.A., Columbia University; seeks position in health education or nutrition. **H462**

Unusually well qualified young woman with background in health education and nutrition is available for immediate appointment in state or local agency. Best references. **H459**

Young woman, Ph.D., Columbia University, splendid background of experience in health education, will consider position as director of public health education. **H294**

Woman, M.D., Boston University; special work Columbia and Massachusetts Institute of Technology; 1 year's experience in state hospital; interested in psychiatry, desires position in the East in hospital for mental diseases or industrial school. **H247**

LABORATORY

Young man, bacteriologist, especially trained in viruses and rickettsiae and all phases of public health laboratory work; Sc.D., Johns Hopkins; now assistant state laboratory director; qualified to consider teaching, executive, administrative, or research position; particularly interested in and qualified for practical laboratory methods with viruses, desires position. **L451**

Bacteriologist, serologist, B.S., M.A. degrees; 2 years' experience foods, dairy, and biochemistry in public health laboratory, desires position in research or routine. **L454**

Bacteriologist, M.S.P.H., University of Michigan; 2½ years as serologist in private hospital; desires work as serologist or bacteriologist in public health laboratory. Willing to start modestly. **L425**

Woman bacteriologist; B.A., Chemistry, 1933; 5 years' experience in experimental and practical therapeutics including animal work, desires position in public health field. L394

SANITARY ENGINEERING

Public health engineer, B.S. in Sanitary Engineering from Massachusetts Institute of Technology; experienced in Massachusetts, Connecticut and Kentucky, seeks position as sanitary or public health engineer with health department. E380

Engineer, aged 28, 3 years' experience as district sanitation supervisor, state department of health, together with work on plumbing, heating, and ventilation, will consider position in the plumbing and heating field or state department of health. Prefers middle western or western states. E453

MISCELLANEOUS

Woman physician, honor graduate in public health, and with training in mental hygiene; seeks a permanent or temporary position in mental hygiene. Prepared for residence studies. Excellent references. M465

Advertisement

Opportunities Available

PUBLIC HEALTH PHYSICIAN — To assist director of department of public health in university medical school; Master's or Doctor's degree public health desirable; teaching experience required; about $4,000. PH-90, Medical Bureau, Palmolive Building, Chicago.

PUBLIC HEALTH PHYSICIANS—(a) County health officer; rural section of South; Southerner preferred; $275. (b) County health officer; man with experience in public health work or willing- [illegible] health training with ex- [illegible])00, plus $600 travel [illegible] h officer; $2,700–$3,600, [illegible] payable monthly; man under 35 required; must own car; opportunity for postgraduate training, advancement in field of public health. (d) Venereal disease clinician; $3,000–$3,900; South. (e) City health physician; all types of public health service except venereal disease and tuberculosis; central city of 250,000; $2,700. PH-91, Medical Bureau, Palmolive Building, Chicago.

STUDENT HEALTH PHYSICIANS—(a) Small but well known southern college; four physicians on staff; duties include medical care of men, consultations, teaching, x-ray supervision; stimulating program. (b) Student health fellowship; 2 year appointment; $1,500, maintenance, for 9 month appointment, first year; $2,250, second year; eastern university. (c) Central university with enrollment of approximately 3,000; excellent university hospital; 9 month appointment; $3,000, increasing to 3,500. (d) Western state college; physician with year's internship eligible; $2,600. (e) Western university; 1 year appointment, including month's vacation; $2,400. PH-92, Medical Bureau, Palmolive Building, Chicago.

PUBLIC HEALTH NURSES—(a) Public health nurse for important position with state department of public health instruction; must be thoroughly experienced in health and physical education; B.S. degree required, Master's preferred. (b) Two for county health appointments; $1,800, $600 travel allowance; southwest. (c) Graduate nurse with degree to serve as counselor in exclusive school for young women; must be 25–30; midsouth. PH-93, Medical Bureau, Palmolive Building, Chicago.

OUTPATIENT DEPARTMENT SUPERVISORS —(a) Fully approved hospital of 300 beds; vicinity nation's capitol. (b) Fairly large general hospital on Atlantic seaboard; nurse with outpatient and accident department experience, 30–35 preferred. (c) University hospital; about $110, maintenance; minimum 2 years' experience in outpatient department clinic supervising required, degree desirable. PH-94, Medical Bureau, Palmolive Building, Chicago.

RESEARCH BACTERIOLOGIST — State Department of health; duties include study of methodology as it pertains to public health bacteriology; Ph.D. or D.Sc. degree required; vicinity $3,000. PH-95, Medical Bureau, Palmolive Building, Chicago.

Situations Wanted

PUBLIC HEALTH PHYSICIAN—B.S., M.D. degrees, university medical school; C.P.H., Johns Hopkins; active in many branches of State Department of Public Health for 10 years; under 40; for further information, please write Burneice Larson, Director Medical Bureau, Palmolive Building, Chicago.

PUBLIC HEALTH NURSE—B.S., Columbia; graduate of a New England training school; nearly 15 years' experience in public health nursing and social service work; 9 years, executive secretary and director of nursing, important organization; for further information, please write Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago.

PUBLIC HEALTH NURSE — Fairly recent graduate of midwestern training school; certified public health nursing; will receive special teachers' certificate upon completion present courses in university medical school; for further details, please write Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago.

NEWS FROM THE FIELD

STUDY TO EVALUATE ORIGINAL SEROLOGIC TESTS FOR SYPHILIS

MORE than five years ago the Committee on Evaluation of Serodiagnostic Tests for Syphilis, in cooperation with the United States Public Health Service, conducted a study to evaluate original serologic tests for syphilis or modifications thereof in the United States. The results of this study were published shortly after the investigation was completed.[1]

Consideration is now being given by the committee to the organization of a second evaluation study of original serologic tests for syphilis or modifications thereof within the next year. If the need for an investigation of this kind seems to justify the cost, invitations will be extended to the authors of such serologic tests who reside in the United States, or who may be able to participate by the designation of a serologist who will represent them in this country. The second evaluation study will be conducted utilizing methods comparable to those employed in the first study.[2]

Serologists who have an original serologic test for syphilis or an original modification thereof and who desire to participate in the second evaluation study should submit their applications not later than October 1, 1940. The applications must be accompanied by a complete description of the technic of the author's serologic test or modification. All correspondence should be directed to the Surgeon General, United States Public Health Service, Washington, D. C.

REFERENCES

1. *Ven. Dis. Inform.*, Washington. June, 16:189, 1935. *J.A.M.A.*, Chicago. June 8, 104:2083, 1935.
2. *J.A.M.A.*, Chicago. Dec. 1, 103:1705, 1934.

FEDERAL COÖRDINATORS OF HEALTH AND WELFARE NAMED

A COMMITTEE to coördinate the health and public welfare efforts of four government agencies in behalf of the national defense program has been announced by Harriett Elliott, member of the U. S. Defense Commission in charge of consumer protection.

The members of the committee are:

Thomas Parran, M.D., Surgeon General of the U. S. Public Health Service, public health and medical problems; Katherine Lenroot, Chief of the Children's Bureau, Department of Labor, child welfare; Arthur J. Altmeyer, Chairman, Social Security Board, social security and welfare; M. L. Wilson, Ph.D., Director, Extension Service, Department of Agriculture, nutrition problems.

The appointment of Gay Shepperson of Atlanta, Ga., as an assistant to work with the coördinators on problems of health and welfare, is also announced; Miss Shepperson was WPA State Administrator for Georgia.

According to Commissioner Elliott, the committee will emphasize the importance of maintaining and improving the standards of health and welfare to the end that citizens may be physically prepared for their responsibilities.

NATIONAL CITIZENS COMMITTEE OF THE WHITE HOUSE CONFERENCE ORGANIZED

A NATIONAL Citizens Committee of the White House Conference on Children in a Democracy has been organized in accordance with the recommendations adopted by the Conference at its closing session on January 20, 1940. Frances Perkins, Chairman of the Conference and Secretary of Labor, appointed an Organizing Committee consisting of Homer Folks, Chairman, William G. Carr, Mrs. Saidie

Orr Dunbar, Rev. Bryan J. McEntegart, and Henry F. Helmholz, M.D.

At its organization meeting the National Citizens Committee adopted objectives of coöperation with official agencies, dissemination of information about the conference and its recommendations, stimulation and aid in the development of state follow-up programs, and the consideration of the special needs of children growing out of emergency conditions.

The present committee consists of 25 persons with Marshall Field, Chairman, Homer Folks, Vice-Chairman, M. O. Bousfield, M.D., Secretary, and James E. West, Treasurer. Headquarters of the Committee are at Room 710, 105 E. 22nd Street, New York, N. Y. Miss H. Ida Curry is Acting Director.

NEW YORK STATE CONFERENCE ON SOCIAL WORK, 1940

THE 1940 New York State Conference on Social Work will be held in New York City, at the Hotel Pennsylvania, October 8–11, inclusive, preceded on the 7th and 8th by the usual Conference Institutes. The Reverend Bryan J. McEntegart, Director of the Division of Children, Catholic Charities of the Archdiocese of New York, is president of the Conference this year. The central theme of the Conference will be "The Child," but all main divisions of social and welfare work will be represented.

Registration may be made and full information obtained by writing to Mary B. Holsinger, Executive Secretary of the Conference, Box 1740, Albany, N. Y.

IDAHO PUBLIC HEALTH ASSOCIATION WILL HOLD FIRST ANNUAL MEETING

IT is announced that the first annual meeting of the Idaho Public Health Association will be held at Twin Falls, Idaho, September 9–10.

HARVARD UNIVERSITY AND AMERICAN RED CROSS ESTABLISH WARTIME HOSPITAL IN ENGLAND

THE American Red Cross and Harvard University announced on August 18 the establishment of a 100 bed hospital in England for the study and treatment of communicable diseases under wartime conditions. The President of Harvard University announced also the formation of a Harvard Public Health Unit for field and laboratory work in epidemiology in Great Britain. The funds for the hospital and the unit will be provided by the American Red Cross and Harvard will furnish the medical staff.

According to the announcement the purpose of the undertaking will be to acquire information relating to the control of influenza and other diseases under unusual or wartime conditions, and the organization of temporary mobile hospitals.

Dr. John E. Gordon, Professor of Preventive Medicine and Epidemiology in the Harvard Medical School, and Dr. John R. Mote of Boston are already in England at the invitation of Hon. Malcolm MacDonald, British Minister of Health.

ASHFORD AWARD IN TROPICAL MEDICINE

AT the annual meeting of the American Society of Tropical Medicine held recently in Memphis, Tenn., the Bailey K. Ashford Award in Tropical Medicine was established by Eli Lilly & Co. to be awarded in alternate years for a total of three times. The award will be $1,000 and a bronze medal suitably engraved. An additional amount of $150 or as much thereof as may be necessary is available toward traveling expenses for the recipient of the award.

It will be given biennially in recognition of demonstrated research in the field of tropical medicine, taking into

consideration independence of thought and originality. The investigator must be a citizen of the United States and less than 35 years of age on January 1 of the year in which the award is made. The recipient must not be associated with a commercial laboratory and need not be a member of the American Society of Tropical Medicine. All nominations must be in the hands of the secretary of the Society at least 60 days before the dates of the annual meeting when the award is being made.

DEATH OF A. J. DOUGLAS, M.D.

DR. A. J. DOUGLAS, for many years Health Officer of Winnipeg, Canada, died on June 30, 1940, less than a month after he had attended a meeting of the Medical Faculty of Manitoba Medical College, which honored him with four other retired members by the presentation of a bronze plaque in recognition of his long service on the Faculty.

Dr. Douglas was born in Ekfrid, Ontario, and was a graduate of Manitoba Medical College. After a year as interne in Winnipeg General Hospital he took postgraduate work in London. He was granted the honorary degree of LL.D. by his alma mater in 1937. He became Winnipeg's first full-time medical officer of health at the age of 26, and served for 40 years. When he took up his work in 1900, typhoid fever was epidemic in Winnipeg.

PERSONALS

Central States

REAVES W. DECROW,† of Columbus, Ohio, has been appointed Health Officer of Clinton County.

DR. LINDSEY J. ERVIN, Director of the Venereal Disease Service at Broadlawns General Hospital, Des Moines, Iowa, has been named temporary director of the Polk County Health Unit. He succeeds DR. EDWIN N. HESBACHER, recently appointed to the staff of the U. S. Marine Hospital in Detroit, Mich., who served as Director of the health unit for a year.

DR. GEORGE E. FRENCH has retired after 37 years as Health Officer of Elyria, Ohio.

MILLARD C. HANSON, M.D., DR.P.H.,* Health Director of Toledo, Ohio, since April, 1937, has resigned to become Director of a syphilis control program in Pittsburgh.

T. M. KOPPA, M.D., C.P.H.,† of the Bureau of Epidemiology, Michigan State Department of Health, Lansing, has been appointed Director of the Tuberculosis Division of that Bureau. He succeeds ARTHUR W. NEWITT, M.D., C.P.H.†

HAROLD A. ROBINSON, M.D.,† of Elyria, Ohio, has been appointed Health Officer of Elyria, succeeding DR. GEORGE E. FRENCH, who has retired.

Eastern States

DR. HOWARD S. ALLEN, of Woodbury, Conn., has been appointed Health Officer of Bethlehem.

DR. JAMES SAMUEL BINKLEY, of New York, N. Y., has been appointed Assistant Managing Director of the American Society for the Control of Cancer, effective June 1.

ALFRED L. BURGDORF, C.P.H., M.D.,† of Hartford, Conn., has been appointed Health Officer of Hartford, to succeed Benjamin G. Horning, M.D., M.P.H.,* who has resigned to join the staff of the American Public Health Association under the Committee on Administrative Practice.

BRUNO F. W. GEBHARD, M.D.,† formerly Technical Consultant for the medical public health exhibits at the New York World's Fair in connection

* Fellow A.P.H.A.
† Member A.P.H.A.

with the American Museum of Health, has been appointed Director of the Cleveland Health Museum and Associate of the Western Reserve University in Health Education. Dr. Gebhard was formerly the Curator of the German Hygiene Museum in Dresden.

ALBERT D. KAISER, M.D.,† of Rochester, N. Y., has been appointed by Governor Lehman to be a member of the temporary legislative commission to formulate a long range health program, succeeding the late DR. THOMAS P. FARMER, of Syracuse.

DR. FRANCIS BRAE RAFFERTY, of Willimantic, Conn., has been appointed Health Officer of Lebanon.

Southern States

NORMAN G. ANGSTADT, M.D.,† of Fayetteville, W. Va., recently Health Officer of Hancock and Wetzel Counties, has been appointed Health Officer of Fayette County. He succeeds LEON A. DICKERSON, M.D.,† who resigned to join the staff of the State Health Department.

HIRAM J. BUSH, M.D.,† of the U. S. Public Health Service, has been named Director of the Henry R. Carter Memorial Laboratory for Malarial Research, Savannah, Ga. He succeeds THOMAS H. D. GRIFFITTS, Sr. Surgeon,† recently transferred to Puerto Rico as Chief Quarantine Officer. DR. CHARLES M. MCGILL has been Acting Director of the laboratory since Dr. Griffitts' departure.

BENJAMIN F. BYRD, M.D.,† of Nashville, Tenn., has been appointed Medical Director of the National Life and Accident Insurance Company, Nashville, to succeed the late DR. RUFUS E. FORT.

TURNER E. CATO, M.D.,† of Charleston, W. Va., for many years Health Officer of Kanawha County, has been given charge of a newly established public health unit in Dade County, Fla., with headquarters in Miami.

FRANK V. CHAPPELL, M.D., has resigned as Director of the Bureau of Local Health Service of the Florida State Board of Health, to accept the position of Director of the Pinellas County Health Department.

AUBREY Y. COVINGTON, M.D.,† of Morganfield, Ky., has resigned as Health Officer of Union County, to take a similar post in Scott County, with headquarters in Georgetown. He succeeds CARL M. GAMBILL, M.D.,† who has joined the staff of the Kentucky State Health Department.

GEORGE B. DAVIS, M.D.,† of Glasgow, Ky., recently Health Officer of Barren County, has been appointed to a similar position in Hart County, with headquarters at Horse Cove.

HAROLD M. ERICKSON, M.D.,† of The Dalles, Ore., has been appointed Director of the Division of Maternal and Child Health in the Oregon State Board of Health, to succeed GEORGE D. CARLYLE THOMPSON, M.D.,† of Portland, who resigned to take a position with the U. S. Children's Bureau.

DR. ROSCOE FAULKNER, of Trenton, Tenn., has been appointed Health Officer of Williamson County, to succeed DON C. PETERSON, M.D.,* of Franklin, who has been appointed Director of Vital Statistics in the State Health Department.

ALFRED H. FLETCHER,* Sanitary Engineer of the Department of Health, Memphis, Tenn., has been appointed Associate in Sanitary Engineering, at the School of Hygiene and Public Health of the Johns Hopkins University, Baltimore, Md., effective August 15. Mr. Fletcher has served

* Fellow A.P.H.A.
† Member A.P.H.A.

with the International Health Division of the Rockefeller Foundation and with the U. S. Public Health Service before he joined the staff in Memphis. Mr. Fletcher will be associated with DR. ABEL WOLMAN, Professor of Sanitary Engineering.

L. J. HANCHETT, M.D., Acting Director of the Bureau of Venereal Disease Control of the Florida State Board of Health, has been appointed Director of the Bureau of Local Health Service.

TASWELL PAUL HANEY, JR., M.D.,* who has been on leave of absence the past year from his position as Director of the Pike County Health Department, McComb, Miss., has been appointed Director of Maternal Hygiene and Child Welfare of the Mississippi State Board of Health.

DR. GEORGE W. JACKSON, of Western State Hospital, has been appointed Health Officer of Bedford County, Tenn.

LESTER M. PETRIE, M.D.,† has been transferred from the Southwestern Health Region, Albany, Ga., to the Northeastern Health Region, Gainesville.

WILLIAM H. PICKETT, M.D.,* of Clearwater, Fla., has resigned as Director of the Health Department of Pinellas County. He has been appointed Assistant State Health Officer, with the Florida Department at Jacksonville.

ALBERT M. PRICE, M.D.,† head of the Division of Communicable Diseases in the State Department of Health, Charleston, W. Va., has been appointed Health Officer of Kanawha County, to succeed TURNER E. CATO, M.D.,† who was recently appointed Health Officer of Dade County, Fla.

GUY V. RICE, M.D.,† of Jesup, Ga., has resigned as Commissioner of Health in Wayne County, and will succeed LESTER M. PETRIE, M.D.,† as Regional Medical Director of the Southwestern Health Region.

GEORGE E. RILEY, M.D., C.P.H.,† of Jackson, Miss., Director of Malaria Control Work in the Mississippi State Health Department, has been named in charge of Pike County.

DR. CLYDE F. ROSS, of Richmond, Va., has been appointed Venereal Disease Control Officer of Richmond, succeeding DR. FRANCIS W. UPSHUR.

EDWIN H. SCHORER, M.D., DR.P.H.,* resigned as Director of Health of Kansas City, Mo., effective May 23.

DR. DONALD B. THURBER, of Louisville, Ky., has been appointed Health Officer of Nicholas County, with headquarters at Carlisle, succeeding DR. JAMES W. SCUDDER, who has been appointed to the staff of the Western State Hospital, Hopkinsville.

CHARLES L. WILLIAMS, M.D.,† Assistant Surgeon General, U. S. Public Health Service, will have charge of the newly established health district unit with headquarters in New Orleans to supervise public health service work in Texas, Louisiana, Florida, Alabama, Georgia, Mississippi, and Tennessee.

DR. DAVID B. WILSON, of McComb, Miss., who has been Acting Director of the Pike County health unit, has accepted a position with the U. S. Public Health Service.

Western States

FRANK J. BAILEY, M.D.,† who formerly served as Health Officer of Red Bluff, Calif., has again been appointed to the position, succeeding DR. RUSSELL G. FREY.

BERTRAM P. BROWN, M.D., of Los Angeles, has been appointed Director of the California State Department of Public Health, to succeed WALTER M. DICKIE, M.D., PH.D.,† of San Francisco.

* Fellow A.P.H.A.
† Member A.P.H.A.

HORACE DELIEN, M.D.,† Special Physician in Tuberculosis Control, has been assigned to duty in the office of the District Medical Director, U. S. Indian Service, San Francisco, to assume direction of tuberculosis control activities among the Indian population of California. Dr. DeLien has recently completed one year of educational experience at the Henry Phipps Institute of Philadelphia, previous to which he was in charge of the Indian Service Sanatorium at Fort Bidwell, Calif. (now discontinued). Dr. DeLien's activities will be extended to include tuberculosis control among Indians in Nevada and Utah in the near future.

CRANFORD H. DOUTHIRT, M.D.,† of Santa Fe, N. M., has been appointed Health Officer of the State of New Mexico, succeeding EDWIN B. GODFREY, M.D.,† resigned.

GUY S. MILLBURY, D.D.S.,* who since 1914 has been Dean of the University of California College of Dentistry, San Francisco, retired as of July 1, and will live at Los Gatos, Calif. Dr. Millbury is immediate Past President of the Western Branch American Public Health Association.

* Fellow A.P.H.A.
† Member A.P.H.A.

GEORGE M. STEVENS, M.D.,* Epidemiologist of the Department of Health of the City of Los Angeles, Calif., is retiring.

DEATHS

DR. S. ADOLPHUS KNOPF, of New York, N. Y., died July 15, at the age of 82. He was active or honorary officer of many important tuberculosis associations, and was the author of many books and pamphlets on tuberculosis.

CHARLES F. MEBUS,† of Glenside, Pa., eminent engineer and former President of Abington Township Board of Commissioners, died June 28, at the age of 75.

CHARLES F. NASSAU, M.D., Sc.D.,† of Philadelphia, Pa., former Health Commissioner, died on August 11.

DAVID RIESMAN, M.D., Sc.D., LL.D., of Philadelphia, Pa., died recently. He was Emeritus Professor of Medicine and Professor of the History of Medicine at the University of Pennsylvania.

DR. JOSEPH W. SCHERESCHEWSKY, of Atlanta, Ga., died recently. He was particularly active in cancer research and in the establishment of state cancer clinics and organized the long-range cancer control program of Georgia.

CONFERENCES AND DATES

American Association of Public Health Dentists. Cleveland, Ohio. September 8–9.

American College of Physicians—25th Annual Session. Statler Hotel, Boston, Mass. April 21–25, 1941.

American Association of State Highway Officials. Seattle, Wash. September 15–19.

American Association of State Registration Executives. Detroit-Leland Hotel, Detroit, Mich. October 8–11.

American Dental Association. Cleveland, Ohio. September 9–13.

American Dietetic Association — 23rd Annual Convention. Pennsylvania Hotel, New York, N. Y. October 20–24.

American Education Week (20th annual observance), November 10–16. Theme: "Education for the Common Defense."

American Hospital Association. Boston, Mass. September 16–20.

American Public Health Association —69th Annual Meeting. Book-Cadillac Hotel, Statler Hotel, Detroit, Mich. October 8–11.

American Public Works Association. Detroit, Mich. September 30–October 2.

American School Health Association. Book-Cadillac Hotel and Hotel Statler, Detroit, Mich. October 7–11.

American Social Hygiene Association. Book-Cadillac Hotel, Detroit, Mich. October 6.

American Society of Civil Engineers—Fall Meeting. Cincinnati, Ohio. October 16–18.

American Water Works Association:

Virginia Section—Monroe Hall, University of Virginia, Charlottesville, Va. September 5–6.

Michigan Section — University of Michigan Union, Ann Arbor, Mich. September 11–13.

Rocky Mountain Section — Cosmopolitan Hotel, Denver, Colo. September 16–17.

Western Pennsylvania Section — Castleton Hotel, New Castle, Pa. September 18–20.

New York Section—Hotel Commodore, New York, N. Y. September 25.

Wisconsin Section — Hotel Manitowoc, Manitowoc, Wis. October 14–16.

Southwest Section — Mayo Hotel, Tulsa, Okla. October 14–17.

New Jersey Section—Madison Hotel, Atlantic City, N. J. October 18–19.

Kentucky-Tennessee Section — Lafayette Hotel, Lexington, Ky. October 21–23.

California Section—Los Angeles Biltmore Hotel, Los Angeles, Calif. October 23–26.

West Virginia Section — Prichard Hotel, Huntington, W. Va. October 24–26.

North Carolina Section—Sir Walter Raleigh Hotel, Raleigh, N. C. October 28–30.

Four States Section—Hotel Dupont, Wilmington, Del. November 7–8.

Minnesota Section—St. Paul Hotel, St. Paul, Minn. November 7–8.

Missouri Valley Section—Hotel Fontenelle, Omaha, Nebr. November 13–15.

Arizona Sewage and Waterworks Association — Fall Meeting. Safford, Ariz. October 4–6.

Association of Women in Public Health. Hotel Statler, Detroit, Mich. October 9.

Association of American Medical Colleges. Ann Arbor, Mich. October 28–30.

Canadian Public Health Association—29th Annual Meeting. Winnipeg, Man. September 23–28.

Civil Service Assembly of the United States and Canada. Cleveland, Ohio. September 30–October 4.

Dairy Industries Supply Association. Atlantic City, N. J. October 21–26.

Federation of Sewage Works Associations—First Annual Convention, in conjunction with the 1940 Annual Meeting of the Central States Sewage Works Association. Hotel Sherman, Chicago, Ill. October 3–5.

Florida Public Health Association. Tampa, Fla. December 5–7.

Government Research Association. Princeton, N. J. September 4–7.

Idaho Public Health Association—First Annual Meeting. Twin Falls, Idaho. September 9–10.

Indiana State Medical Association. French Lick Springs Hotel, French Lick, Ind. October 29–31.

Institute on Science and the Nation's Food. Wellesley College, Wellesley, Mass. October 24–26.

International Association of Milk Sanitarians. Joint Meeting with the New York State Association of Dairy and Milk Inspectors. Hotel Pennsylvania, New York, N. Y. October 17–19.

International City Managers' Association. Colorado Springs, Colo. September 23–26.

International Society for Crippled Children. Asheville, N. C. October 6–9.

International Society of Medical Health Officers. Hotel Statler, Detroit, Mich. October 6.

Interstate Post-Graduate Medical Assembly. Cleveland, Ohio. October 13–19.

Michigan Public Health Association. Book-Cadillac Hotel and Hotel Statler, Detroit, Mich. October 7–11.

Michigan Society for Mental Hygiene, Inc.—Annual Conference. Grand Rapids, Mich. October 10–12.

Municipal Public Health Engineers. Hotel Statler, Detroit, Mich. October 6–8.

National Association of Public School Business Officials. Detroit, Mich. October 14–18.

National Chemical Exposition—sponsored by the Chicago Section of the American Chemical Society. Stevens Hotel, Chicago, Ill. December 11–15.

National Organization for Public Health Nursing. Hotel Statler, Detroit, Mich. October 7.

National Pest Control Association—8th Convention. Indianapolis, Ind. October 28–30.

National Recreation Congress—25th. Statler Hotel, Cleveland, Ohio. September 30–October 4.

National Restaurant Association. Chicago, Ill. October 7–11.

National Safety Council. Chicago, Ill. October 7–11.

New Jersey Health and Sanitary Association, Inc. 66th Annual Meeting. Hotel Berkeley-Carteret, Asbury Park, N. J. November 15–16.

New York State Conference on Social Work. Hotel Pennsylvania, New York, N. Y. October 8–11.

Pacific Coast Plumbing Inspectors Association—11th Annual Convention. Sainte Clare Hotel, San Jose, Calif. October 10–12.

Pan-American Congress of Ophthalmology. Hotel Cleveland, Cleveland, Ohio. October 11–12.

Society of American Bacteriologists. St. Louis, Mo. December.

State Directors of Health Education. Book-Cadillac Hotel, Detroit, Mich. October 7.

State Directors of Local Health Services. Book-Cadillac Hotel, Detroit, Mich. October 10.

State Directors of Public Health Nursing. Book-Cadillac Hotel, Detroit, Mich. October 7.

Symposium on Industrial Health, under the sponsorship of the Department of Preventive Medicine, Medical College of Virginia. Baruch Auditorium in the Egyptian Building, Medical College, Richmond, Va. September 12–13.

Texas Public Health Association. Fort Worth, Tex. September 30–October 2.

Tri-State Conference of Food and Health Officials. Pittsburgh, Pa. October.

United States Conference of Mayors—1940 Annual Conference. Waldorf-Astoria Hotel, New York, N. Y. September 19–21.

University of Chicago, Chicago, Ill. Fiftieth Anniversary Year: October 1, 1940–September, 1941.

University of Pennsylvania: Bicentennial Conference—Fine Arts, Humanities, Medical Sciences, Natural Sciences, Religion, Social Sciences. University of Pennsylvania, Philadelphia, Pa. September 16–20.

West Virginia Public Health Association. Morgan Hotel, Morgantown,

W. Va. October 31, November 1–2.
Western Governmental Research Association. Los Angeles, Calif. October 24–26.

Foreign

Pan American Congress of Tuberculosis—Fifth. Buenos Aires, and Cordoba, Argentina. October 13–17.

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a quantitative plate method was substituted for the usual lactose broth technic. The present study also included identification of organisms growing on agar plates, quantitative counts on yeasts and molds, and counts of spores of clostridia. The effect of allowing milk to stand at room temperature, and its subsequent action on guinea pigs was also studied.

The Sanitary Code of the City of New York in effect during the period of this study gives in detail the conditions for the production and handling of Grade A and Grade B milks. In many respects, the regulations are alike for the two milks, the differences applying chiefly to the bacterial counts and temperatures at which the milk may be kept. Summarized, the differences are:

	Grade A Milk	*Grade B Milk*
Raw milk intended for country pasteurization, count not to exceed	100,000	300,000
Raw milk intended for city pasteurization, count not to exceed	200,000	750,000
Pasteurized milk, count not to exceed	30,000	50,000
Night's milk to be cooled to	50° F.	60° F.
Uncooled morning milk to be delivered to receiving stations before	8 A.M. summer 9 A.M. winter	9 A.M.
Age limit for pasteurized milk	36 hours	54 hours
Lip cover cap	required	not required

The requirements for pasteurization are identical.

In the case of Grade A milk the industry has added other requirements and regulatory procedures which serve practically to increase the difference between the two milks. The Grade A farmers have a more complete veterinary service than the Grade B farmers and have training and equipment to detect mastitis. An important additional control measure is the testing by plate counts of each Grade A source of milk 6 to 9 times a month. (The milk of each Grade B farm is tested once a month by microscopic test.) Grade A milk is sold to the consumer for an additional 1½ to 3 cents a quart. A farmer producing Grade A milk may

TABLE 1

Distribution of Samples

Part I—According to Place of Collection

Grade	*A Raw*	*B Raw*	*A Pasteurized*	*B Pasteurized*
Total number of samples	185	341	231	373
City pasteurizing plants	181	339	206	318
Country plants or receiving stations	4	2	16	4
Stores:				
Bottles	0	0	9	16
Paper containers	0	0	0	35
No. samples over 1 day old	0	0	19(9.8%)	11(3.6%)
Part II—According to Original Source				
No. of distributors represented	6	10	13	35
No. of city pasteurizing plants	9	16	14	41
No. of receiving stations	35	133	39	161
No. country pasteurizing plants	0	0	2	2

receive a share of this premium if he produces milk with a count of 25,000 or under, and an extra bonus if the milk has a count below 10,000.[1, 2]

LABORATORY STUDIES ON THE FLORA OF GRADE A AND GRADE B MILKS

The study of the comparative bacteriology of Grade A and Grade B milks was begun in April, 1939, and continued until the middle of March, 1940. In all, 1,130 samples were collected and studied, the total including 185 A raw, 231 A pasteurized, 341 B raw, and 373 B pasteurized milks. The distribution of the samples by place of collection and by the number of companies and pasteurizing plants may be found in Table 1.

Since the country pasteurized samples constitute such a small portion of the total, they have been incorporated with the city pasteurized milks in the tabulation of results.

Samples, on collection, were transported to the laboratory in ice when the weather required. In most instances the milk was ready for analysis within 2 or 3 hours after collection.

In the laboratory, tests were set up and inoculations made for:

1. Total count on Old Standard Methods Agar
2. Total count on New Standard Methods Agar
3. Count on blood agar
4. Microscopic count (Breed count)
5. Identification of genera and species of organisms found on plates.

TABLE 2

Standard Methods Counts

Month	No. Samples	Counts				
		Highest	Lowest	Median	Geometric Mean	No. Samples Above Present Code Limits
Part I—Grade A Raw Milk on Old Agar						
Apr., 1939	..					..
May	..					..
June	20	360,000	17,000	23,000	42,000	1
July	12	320,000	2,500	29,000	28,000	1
Aug.	10	1,800,000	19,000	126,000	140,000	4
Sept.	8	180,000	5,200	28,000	27,000	0
Oct.	25	380,000	2,800	20,000	25,000	3
Nov.	19	450,000	14,000	25,000	35,000	1
Dec.	18	28,000	7,000	18,000	16,000	0
Jan., 1940	25	75,000	4,000	15,000	26,000	0
Feb.	22	90,000	8,000	29,000	26,000	0
Mar.	7	60,000	7,000	24,000	26,000	0
Part II—Grade B Raw Milk on Old Agar						
Apr., 1939	..					..
May	..					..
June	29	1,500,000	60,000	170,000	210,000	2
July	29	3,900,000	65,000	230,000	310,000	5
Aug.	28	5,400,000	75,000	370,000	420,000	6
Sept.	23	2,000,000	42,000	430,000	400,000	5
Oct.	45	2,200,000	5,000	170,000	170,000	5
Nov.	36	1,000,000	5,000	98,000	110,000	1
Dec.	47	400,000	20,000	85,000	80,000	0
Jan., 1940	40	1,000,000	10,000	150,000	110,000	1
Feb.	31	1,200,000	15,000	200,000	150,000	2
Mar.	17	1,200,000	48,000	170,000	180,000	1

6. Quantitative count of coliform organisms.
7. Quantitative count of clostridia (*B. welchii*) spores
8. Quantitative count of yeasts and molds on Sabouraud's Agar
9. Toxicity test on guinea pigs (explained later)

The results of each of these tests are presented in the tables and text given below, together with a brief discussion of their possible significance.

BACTERIAL COUNTS OF GRADE A AND GRADE B MILKS

(Old and New Standard Methods Agar, Blood Agar)

The Standard Methods counts on the old agar and the new agar (adopted as the official medium of the American Public Health Association, July, 1939) are given in Tables 2 and 3.

In these tables, the median count may be considered as the most significant figure. Since it is the middle figure when the counts are arranged in numerical order, it puts no undue value on a few excessively high or very low counts which frequently occur in such a listing and which may considerably affect the arithmetic mean or average. The geometric mean (Charts I and II) has also been computed for each month because it is commonly used in reports of health departments. Its numerical value in most cases is very close to that of the median. The monthly median values for Grade A raw milk vary from 22,000 to 300,000. The value of 300,000 in August is out of all proportion to the rest of the figures, the next one in order of magnitude being 53,000. A

TABLE 2 (Cont.)

Standard Methods Counts

Month	*No. Samples*	*Counts*				*No. Samples Above Present Code Limits*
		Highest	*Lowest*	*Median*	*Geometric Mean*	
		Part III—Grade A Pasteurized Milk on Old Agar				
Apr., 1939	..					..
May	..					..
June	23	1,200	350	920	800	0
July	17	4,200	150	450	520	0
Aug.	10	28,000	80	1,600	1,400	0
Sept.	9	7,600	180	1,100	1,200	0
Oct.	21	3,800	130	960	820	0
Nov.	24	3,200	220	650	800	0
Dec.	25	1,200	40	500	390	0
Jan., 1940	35	6,400	100	360	350	0
Feb.	28	4,200	50	400	420	0
Mar.	9	900	50	100	250	0
		Part IV—Grade B Pasteurized Milk on Old Agar				
Apr., 1939	..					..
May	..					..
June	34	85,000	2,200	8,900	7,500	2
July	34	81,000	560	9,500	9,800	0
Aug.	28	22,000	1,200	5,800	5,100	0
Sept.	21	41,000	2,300	8,100	9,600	1
Oct.	50	2,500,000	1,300	9,300	8,200	2
Nov.	33	60,000	1,200	9,500	8,000	1
Dec.	32	90,000	450	11,000	9,600	1
Jan., 1940	45	200,000	380	6,800	6,200	2
Feb.	35	32,000	900	10,000	7,800	0
Mar.	20	85,000	1,500	5,500	6,700	2

TABLE 3

Standard Methods Counts

Part I—Grade A Raw Milk on New Agar

Month	No. Samples	Counts				No. Samples Above Present Code Limits
		Highest	Lowest	Median	Geometric Mean	
Apr., 1939	..					..
May	13	80,000	10,000	23,000	27,000	0
June	20	6,000,000	16,000	53,000	69,000	2
July	12	550,000	4,500	37,000	48,000	1
Aug.	10	3,500,000	31,000	300,000	270,000	6
Sept.	8	220 000	15,000	48,000	53,000	1
Oct	25	620,000	6,200	46,000	54,000	3
Nov.	19	750,000	20,000	45,000	57,000	1
Dec	18	480,000	12,000	35,000	45,000	2
Jan., 1940	25	120,000	9,500	22,000	22,000	0
Feb.	22	220,000	16,000	45,000	41,000	2
Mar.	7	120 000	10,000	40,000	40,000	0

Part II—Grade B Raw Milk on New Agar

Apr., 1939	..					..
May	29	1,900,000	86,000	310,000	320,000	5
June	29	45,000,000	160,000	510,000	610,000	9
July	29	6,600 000	65,000	400,000	570,000	9
Aug.	28	12,000,000	180,000	890,000	960,000	16
Sept	23	6,300,000	45,000	550,000	400,000	8
Oct.	45	4,300,000	35,000	440,000	440,000	16
Nov.	36	2,500,000	40 000	180,000	190,000	1
Dec.	32	750,000	25,000	160,000	140,000	0
Jan., 1940	40	830,000	17.000	190,000	170,000	1
Feb.	31	1,900,000	40 000	240,000	270,000	4
Mar.	19	1,700,000	75,000	270,000	300,000	3

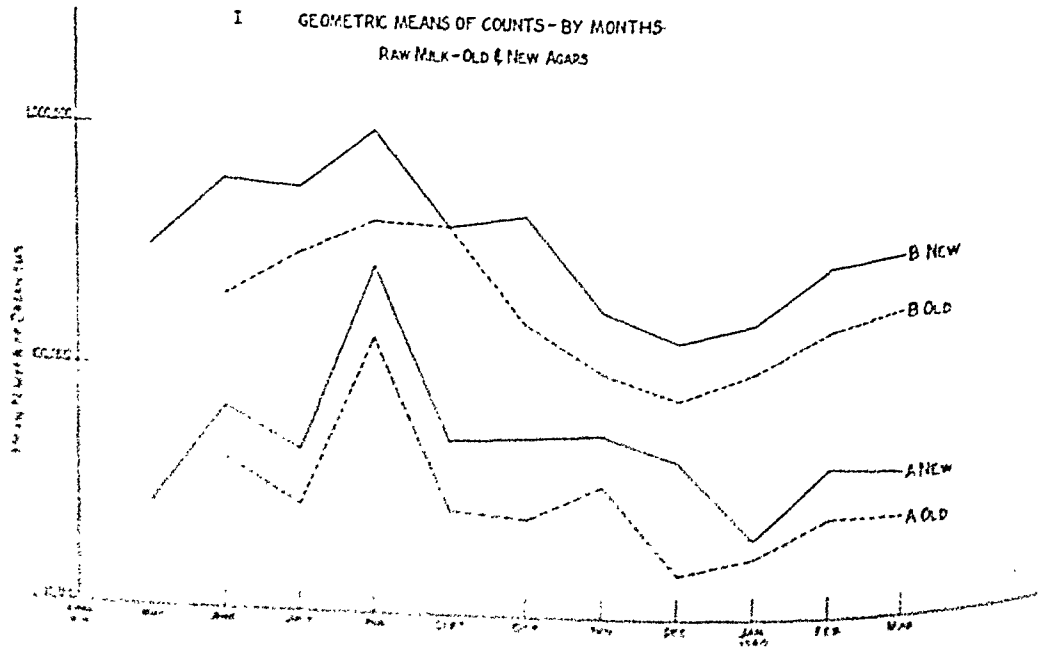


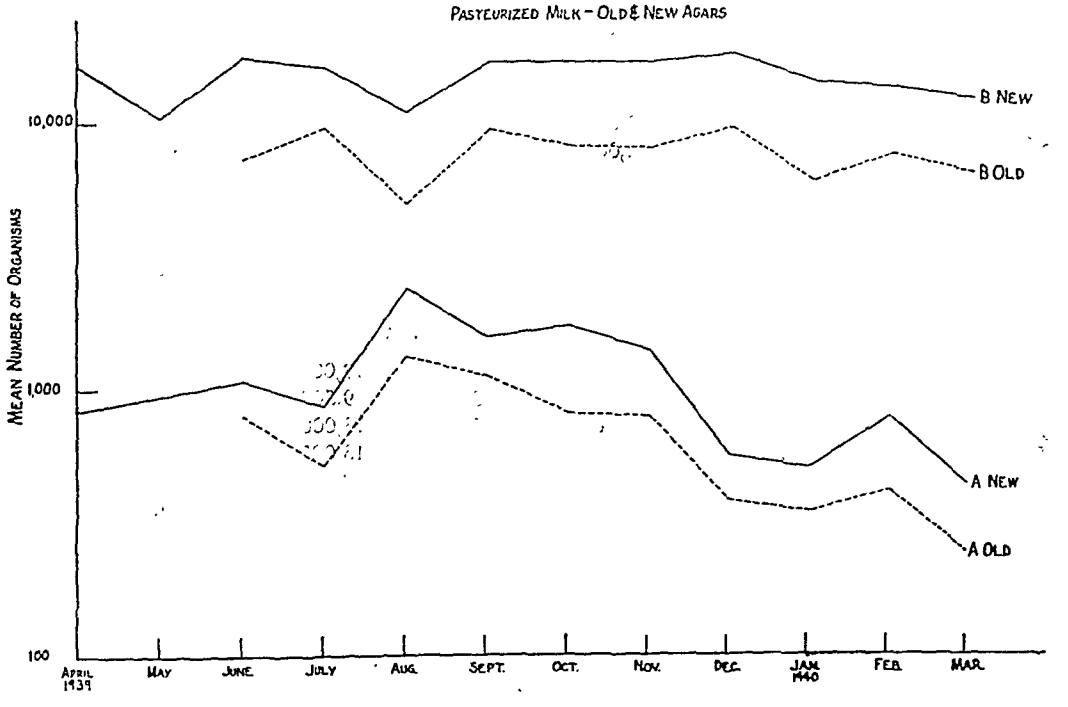
TABLE 3 (Cont.)

Standard Methods Counts

Month	*No. Samples*	*Counts*				*No. Samples Above Present Code Limits*
		Highest	*Lowest*	*Median*	*Geometric Mean*	
		Part III—Grade A Pasteurized Milk on New Agar				
Apr., 1939	6	1,500	350	700	830	0
May	20	210,000	180	1,000	960	1
June	23	2,600	460	1,100	1,100	0
July	17	4,600	100	820	870	0
Aug.	10	42,000	100	1,600	2,400	1
Sept.	9	15,000	430	1,500	1,600	0
Oct.	21	7,500	520	2,200	1,800	0
Nov.	24	3,900	250	1,300	1,400	0
Dec	25	1,800	180	720	580	0
Jan., 1940	35	2,500	120	450	520	0
Feb.	28	2,600	200	850	820	0
Mar.	9	1,800	120	500	450	0
		Part IV—Grade B Pasteurized Milk on New Agar				
Apr., 1939	7	77,000	5,300	17,000	17,000	1
May	33	620,000	1,200	9,500	11,000	3
June	34	130,000	3,400	13,000	18,000	7
July	34	110,000	1,800	13,000	17,000	4
Aug.	28	98,000	1,400	8,400	12,000	2
Sept.	21	65,000	3,600	12,000	17,000	1
Oct.	50	250,000	3,500	17,000	17,000	5
Nov.	33	92,000	4,500	15,000	17,000	2
Dec	32	200,000	2,300	12,000	18,000	6
Jan., 1940	45	290,000	560	13,000	15,000	5
Feb	35	60,000	1,800	21,000	14,000	1
Mar.	20	90,000	1,200	12,000	13,000	4

II GEOMETRIC MEANS OF COUNTS - BY MONTHS

PASTEURIZED MILK - OLD & NEW AGARS



second figure of interest is the number of samples above the limits prescribed by the code. In the case of Grade A raw it was 18 out of 182 samples tested (new agar).

The grade B raw milks varied in median counts from 160,000 to a high of 890,000, the largest figure being that for August. The figures between these two values are fairly evenly spaced. Seventy-two samples were above the code limits out of a total of 337 milks tested.

Among the pasteurized milks, the median counts varied from 450 to 2,200 in the Grade A, the largest figure being that for October. Two samples out of 231 were above the prescribed limits of the code. Among the Grade B samples, the figures varied from 8,400 to 21,000, with 41 out of 370 exceeding the code limits (all new agar).

While the median counts may be taken as the best index of milk quality, the presence in any group of counts of unusually high numbers is worthy of attention. Thus, the median for two series of milk counts may be identical, but the figures above the median in one case may be very close to the median, while in the second case there may be a considerable spread between the median and the highest count. Obviously, quality as represented by the second series of counts is inferior to that of the first. As a means of measuring this spread above the median value, the *upper quartile* is found, which is simply the median of the upper half of the series of numbers. The ratio of the

TABLE 4

Median Counts (M), Upper Quartiles (Q), and Ratio (Q/M), by Months for Each Kind of Milk (Based on New Standard Methods Agar Counts)

Part I—Raw Milk

Months	Grade A			Grade B		
	Median	Upper Quartile	Ratio	Median	Upper Quartile	Ratio
Apr., 1939			...			...
May	23,000	37,000	1.6	310,000	410,000	1.3
June	53,000	89,000	1.7	510,000	890,000	1.7
July	37,000	45,000	1.2	400,000	1,700,000	4.2
Aug.	300,000	480,000	1.6	890,000	1,800,000	2.0
Sept.	48,000	140,000	2.9	550,000	1,100,000	2.0
Oct.	46,000	72,000	1.6	440,000	1,200,000	2.7
Nov.	45,000	90,000	2.0	180,000	400,000	2.2
Dec.	35,000	75,000	2.1	160,000	220,000	1.4
Jan., 1940	22,000	38,000	1.7	190,000	310,000	1.6
Feb.	45,000	55,000	1.2	240,000	450,000	1.9
Mar.	40,000	42,000	1.1	270,000	650,000	2.4

Part II—Pasteurized Milk

Apr., 1939	700	1,400	2.0	17,000	20,000	1.2
May	1,000	1,300	1.3	9,500	21,000	2.2
June	1,100	1,300	1.2	13,000	23,000	1.8
July	820	1,700	2.1	13,000	31,000	2.4
Aug.	1,600	3,100	1.9	8,400	24,000	2.9
Sept.	1,500	1,700	1.1	12,000	31,000	2.6
Oct.	2,200	3,600	1.6	17,000	49,000	2.9
Nov.	1,300	2,000	1.5	15,000	28,000	1.9
Dec.	720	1,100	1.5	12,000	58,000	4.8
Jan., 1940	450	950	2.1	13,000	42,000	3.2
Feb.	550	1,100	1.3	21,000	29,000	1.4
Mar.	500	1,600	3.2	12,000	22,000	1.8

upper quartile to the median then expresses the variability of the figures above the median; a ratio close to unity thus indicates that the figures above the median are not far from it numerically. These ratios are given in Table 4 for the Grades A and B milk counts on the new agar.

The distribution of the ratios is as follows:

Grade A milk 23 ratios 9 between 1.1 and 1.6
9 between 1.6 and 2.1
5 2.1 and above
highest ratio = 3.1
average = 1.7

Grade B milk 23 ratios 4 between 1.1 and 1.6
8 between 1.6 and 2.1
11 2.1 and above
Highest ratio = 4.8
average = 2.3

These results show that the variability of the Grade B milk is greater than that of Grade A or, to express the matter in another way, Grade A milk is a more uniform product, from the bacteriological standpoint, than is Grade B.

The distribution of all of the counts on old and new agar is given in Table 5.

These results show the comparative predominance of Grade A samples among the low counts and the relative shift in groupings which results from the use of the new agar.

A comparison of the geometric means of the raw milk with those of the pasteurized gives an overall measure of what may be termed the pasteurizability of each milk, or the efficiency of the pasteurization process. In Table 6 this relationship is expressed as the percentage of organisms surviving pasteurization.

It will be noted that in practically all cases, the percentage survival is smaller in the Grade A milks than in the Grade B, a fact which signifies that Grade A milk is more efficiently pasteurized or that there are present in Grade B milks organisms which are less susceptible to pasteurization than those which are found in Grade A milk. The differences between the old and new agars are not very great.

A comparison of the geometric means of Grade A milk and Grade B milk gives a relationship which sums up in a single figure, the comparative quality

TABLE 5

Distribution of Standard Methods Counts

Part I—Raw Milk—Old and New Standard Methods Agar

Grade	No. of Samples Examined	Grouping of Counts: 10,000 and Under		10,001–50,000		50,001–100,000		100,001–200,000		200,001–500,000		500,001–750,000		Over 750,000	
		No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
A raw (new)	182	4	2.2	105	57.7	37	20.4	20	11.0	8	4.4	3	1.7	5	2.7
B raw (new)	341	0	0	15	4.4	39	11.4	63	18.5	114	33.5	37	10.8	73	21.4
A raw (old)	152	17	11.2	106	69.8	16	10.5	3	2.0	7	4.6	1	0.6	2	1.3
B raw (old)	286	3	1.0	47	16.4	42	14.7	70	24.5	82	28.7	14	4.9	28	9.8

Part II—Pasteurized Milk—Old and New Standard Methods Agar

Grade	No. of Samples Examined	Grouping of Counts: 1,000 and Under		1,001–5,000		5,001–10,000		10,001–30,000		30,001–50,000		Above 50,000	
		No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
A past. (new)	227	110	48.5	108	47.6	5	2.2	2	0.8	1	0.4	1	0.4
B past. (new)	373	1	0.3	42	11.2	82	22.2	161	43.1	42	11.2	45	12.0
A past. (old)	182	143	78.6	35	19.2	3	1.7	1	0.6	0	0	0	0
B past. (old)	299	6	2.0	101	33.8	80	26.7	94	31.5	9	3.0	9	3.0

TABLE 6

*Mean Percentage Survival of Organisms in Pasteurized Milk by Months**

Month	Grade A		Grade B	
	New Agar	Old Agar	New Agar	Old Agar
Apr., 1939	...	...	...	...
May	3.6	...	3.4	...
June	1.6	1.9	2.9	3.6
July	1.8	1.9	3.0	3.1
Aug.	0.89	1.0	1.2	1.2
Sept.	3.0	4.3	4.3	2.4
Oct.	3.3	3.3	3.9	4.8
Nov.	2.5	2.3	8.9	7.3
Dec.	1.3	2.4	12.9	12.0
Jan., 1940	2.4	2.2	8.8	5.6
Feb.	2.0	1.6	5.2	5.2
Mar.	1.1	0.96	4.4	3.7
Average	2.1		5.3	

* Values of $\left(\frac{\text{geometric mean of pasteurized milk} \times 100}{\text{geometric mean of raw milk}}\right)$

of the two milks for any given month or period. These comparisons are given in Table 7.

The figures vary (on the new agar) from 3.1 to 11.9 for the raw milks. For the period of the study the average was 7.1 (6.6 on the old agar), indicating a sevenfold difference in the raw milk counts of Grade A and Grade B milks. For the pasteurized milks, the difference is much greater, varying from 5 to 31 times, or an average of 17.4 times. This last figure, when compared to the 7.1 average above, gives another expression of the greater relative pasteurizability of Grade A milk.

It has generally been stated that the newly adopted agar medium has little effect on counts which are low on old agar, but that it may as much as double

TABLE 7

Comparison of Geometric Means of Grade A and Grade B Milks by Months

Part I—Raw Milk

Month	Ratio B/A	
	Old Agar	New Agar
Apr., 1939	...	...
May	...	10.2
June	5.0	8.9
July	11.2	11.9
Aug.	3.0	3.6
Sept.	14.8	7.5
Oct.	6.8	8.2
Nov.	3.2	3.3
Dec.	5.0	3.1
Jan., 1940	4.2	7.8
Feb.	5.8	6.6
Mar.	6.9	7.4
Average	6.6	7.1

Part II—Pasteurized Milk

Month	Ratio B/A	
	Old Agar	New Agar
Apr., 1939	...	20.6
May	...	11.4
June	9.4	16.3
July	18.8	19.5
Aug.	3.6	5.0
Sept.	8.0	10.6
Oct.	10.0	9.5
Nov.	10.0	12.2
Dec.	24.6	31.0
Jan., 1940	17.7	29.0
Feb.	18.5	17.1
Mar.	27.0	29.0
Average	14.8	17.4

TABLE 8

Distribution of Counts on Blood Agar

	No. of Samples	10,000 and Under		10,001–50,000		50,001–100,000		100,001–200,000		200,001–500,000		500,001–750,000		Over 750,000	
		No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
A raw	182	18	10	121	66.4	26	14.3	8	4.4	6	3.3	0	0	3	1.6
B raw	337	0	0	38	11.3	61	18.1	86	25.5	88	26.1	23	6 8	41	12.2

	No. of Samples Examined	1,000 and Under		1,001–5,000		5,001–10,000		10,001–30,000		30,001–50,000		Over 50,000	
		No.	%	No.	%	No.	%	No	%	No	%	No.	%
A past.	231	180	78.0	44	19.0	3	1.4	1	0.4	1	0 4	2	0.8
B past.	370	7	1.9	111	30.0	102	27 5	112	30 3	19	5 1	19	5.1

the counts of poor quality milk. Our own results as a general rule do not confirm this finding. They show that all of the counts are increased, those for raw milk almost doubled, while those for pasteurized increase by about one to one-and-one-half times. The increase in counts on the new agar places more samples of Grade B milk than of Grade A in the category of exceeding the limits permitted by the code. Whether a ratio of counts is proper for a comparison of the two media is a matter of question since the additional organisms which grow on the new media may bear no relationship to the ones which grow on the old. In such a case a ratio would be misleading and the absolute increase on the new medium would be the only figure of significance. It may be noted that the absolute increases for Grade A are small as compared to the increases in counts of Grade B milk when passing from the old to the new medium. It would seem probable that the organisms which grow in the new medium but not on the old, require milk or milk derivatives for growth. The new medium supplies these materials. The peculiar need of the organisms for milk is demonstrated in the higher counts on the new medium as compared with those on blood agar (compare Tables 5 and 8). For most organisms infusion blood agar would be considered more favorable to a maximum yield of colonies. The need for milk suggests that the organisms in question may come from poorly washed or inadequately sterilized equipment.

The fact that the two media produce such different pictures of bacterial content for the same milk emphasizes the arbitrary nature of any "Standard Methods count." This arbitrariness constitutes no objection to the use of such technic as one of the means of controlling a given milk supply, provided, of course, that a correlation has been established between the counts in question and the sanitary quality of the milk. In comparing two different kinds of milk, on the other hand, the Standard Methods count, while of primary importance, must be supplemented by other bacteriological studies if we are properly to evaluate differences in the two milks. As examples, we may mention (1) the kinds of organisms which constitute the flora counted on the plates, and (2) the kinds and numbers of organisms which do not grow on the Standard Methods agar, such as the anerobic spore-forming organisms.

THE MICROSCOPIC COUNT

The direct microscopic count (Table 9), which was done as a routine procedure for all milks received, constitutes a check on the plate methods, first, since the plate methods do not distinguish between colonies of organisms and individuals in the milk, and second, because organisms may be

TABLE 9

Distribution of Microscopic Counts Based on Counts of Individual Cells

	No. of Samples Totals	100,000 and Under		100,001–500,000		500,001–1,000,000		Over 1,000,000	
		No.	%	No.	%	No.	%	No.	%
A raw	185	84	45.4	67	36.2	13	7.1	21	11.3
B raw	326	41	12.6	161	49.4	54	16.6	70	21.4
	No. of Samples Totals	50,000 and Under		50,001–250,000		250,001–750,000		Over 750,000	
		No.	%	No.	%	No.	%	No.	%
A past.	231	141	61.0	50	21.6	23	10.0	17	7.4
B past.	366	104	28.4	142	38.8	90	24.6	30	8.2

present, which although capable of being stained have requirements for growth too fastidious for the medium upon which they are planted. An examination of Table 9 shows counts that are higher than those obtained by the plate methods, but indicates as definitely as do the plate counts, the predominance of lower counts among Grade A samples.

IDENTIFICATION OF ORGANISMS ISOLATED FROM AGAR PLATES

In order to determine the kinds of bacteria which constitute the flora of Grade A and Grade B milk, studies were made of organisms isolated from Standard Methods plates and blood agar plates. Two colonies from each were examined. Morphology, reaction to the Gram stain, and a few sugar reactions of the organisms were noted. With the help of these and reference to *Bergey's Manual of Determinative Bacteriology* (4th and 5th Editions), organisms wherever possible, were placed in their proper genera. Table 10 summarizes the findings.

TABLE 10

Organisms Isolated from Agar Plates

No. of Samples in Which Organism Was Found (Per cent in Parentheses)

	A Raw (Total 179 Samples)	B Raw (Total 341 Samples)	A Pasteurized (Total 227 Samples)	B Pasteurized (Total 372 Samples)
Staphylococcus and micrococcus	175 (97.7)	296 (87.8)	140 (61.7)	168 (45.1)
Streptococcus alpha hemolytic viridans	131 (73.0)	300 (87.9)	164 (72.2)	355 (95.5)
Bacillus	127 (70.8)	253 (74.2)	148 (65.0)	131 (35.2)
Streptococcus beta hemolytic	69 (38.5)	145 (42.5)	5 (2.2)	30 (8.1)
Escherichia	38 (21.2)	89 (26.4)	6 (2.7)	15 (4.0)
Aerobacter	31 (17.3)	93 (30.0)	0	7 (1.9)
Unclassified non-fermenting bacilli	6 (3.4)	13 (3.8)	1 (0.4)	4 (0.9)

Organisms Less Frequently Found

Alcaligenes—	6 (A raw),	6 (B raw),	1 (A past.),	5 (B past.)
Lactobacillus	1 "	—	16 "	15 "
Achromobacter	2 "	2 "	—	—
Flavobacteria	—	—	—	1 "
Chromobacter	—	1 "	—	1 "
Pseudomonas	2 "	8 "	—	—
Sarcina	3 "	7 "	—	—
Serratia	—	5 "	34 "	23 "
Proteus	6 "	5 "	—	—
Actinomyces	—	—	—	—
			7 "	6 "

This tabulation does not show yeasts and molds which were grown on a special medium, the counts of which are reported in another section. Clostridia were also grown on a special medium, and the counts are given elsewhere (see Table 14). The coliform counts reported are those obtained in the routine examination of the plates described above. By the use of special media and larger inoculum, a much larger count was obtained. This will be discussed in reference to Table 12.

It will be noted that this study yielded no organism which can be said to be characteristic of Grade A or Grade B milk, although the frequency of occurrence of some of the organisms varied. Staphylococci and micrococci were isolated with greater regularity from Grade A than from Grade B milk, whereas the viridans streptococcus was somewhat more common to Grade B milk. Both organisms are inhabitants of the normal udder, although both types also occur in fecal material. Both organisms occur in sufficient numbers to survive pasteurization.

One group of organisms which is always under suspicion of being potentially pathogenic, the beta hemolytic streptococci, was further studied by means of the Lancefield precipitation test with the following results:

		Classification							
		Group A		Group B		Group C		Other Groups	
Grade	No. of Samples	No.	%	No.	%	No.	%	No.	%
A	27	0	0	18	66.7	62	22.0	3	11
B	64	0	0	36	56.2	16	25.0	12	19

Of particular interest is the fact that group A, which includes the majority of the beta-streptococci of human origin, has no representatives, whereas group B, which contains organisms of bovine origin has the greatest number of strains for both Grade A and Grade B milks. Group C, which contains organisms some of which may be animal pathogens, yielded like percentages for both Grade A and Grade B milks. Our results agree with those of Carr as to group A but are reversed for the frequencies in groups B and C.

The other organisms in the list are for the most part inhabitants of air, water, soil, and manure. It is a matter of considerable interest that organisms of the commonly recognized intestinal pathogenic types, such as typhoid, paratyphoid, and dysentery, were never encountered in any of the raw or pasteurized milks. The "unclassified bacilli" in the table corresponded culturally to the genus *Brucella,* but did not agglutinate with anti-Brucella serum.

COUNTS ON VIOLET RED BILE AGAR (COLIFORM ORGANISMS)

A special study of coliform organisms (Table 11) was made using a quantitative method with agar plates prepared with violet red blood agar. On this medium coliform organisms produce red or pink colonies on 24 hour incubation at 37° C. In addition to coliform organisms certain Gram-positive bacilli produce red colonies which cannot be distinguished. While this introduces an error in the counts, these same organisms are called coliform if the Standard Methods presumptive test alone is applied. In most studies on milk the confirmatory tests are not done. Both pasteurized milks made a good showing, in that 93 per cent of Grade A and 81 per cent of Grade B

TABLE 11

Distribution of Coliform Counts (Violet Red Bile Agar Counts)

	Raw Milk				*Pasteurized Milk*				
	A Raw		*B Raw*		*A Pasteurized*		*B Pasteurized*		
Group	*No.*	*%*	*No.*	*%*	*Group*	*No.*	*%*	*No.*	*%*
0–10	18	10.0	0	0	0	215	93.0	308	81.5
11–100	41	22.8	12	3.5	1–10	11	4.8	55	14.6
101–1,000	64	35.5	72	21.1	11–100	5	2.1	11	2.85
1,001–10,000	46	25.6	172	50.5	101–1,000	0	0	4	1.05
Over 10,000	11	6.1	85	24.9	1,001–10,000	0	0	0	0
Total	180	100.0	341	100.0	Total	231	99.9	378	100.0

yielded 0 colonies per cc. None of the Grade A milks yielded above 1,000 colonies, whereas approximately 1 per cent of the Grade B milks fall into this group. In the raw milks, 10 per cent of the Grade A samples yielded 10 or fewer colonies per cc. None of the Grade B samples fell into this category. At the other extreme, in the group of "over 10,000 per cc." were found 6.1 per cent of the Grade A samples and 24.9 per cent of the Grade B.

TABLE 12

Geometric Means of Violet Red Bile Agar Counts (Coliform Organisms)

Raw Milk by Months

Month	*Grade A*	*Grade B*
Apr., 1939	5	2,700
May	160	1,800
June	730	7,300
July	370	5,500
Aug.	3,800	17,000
Sept.	1,100	9,300
Oct.	300	2,800
Nov.	780	1,200
Dec.	100	1,700
Jan., 1940	60	2,900
Feb.	360	1,000
Mar.	240	2,100
Geometric mean of series	430	6,700

A study was made of the types of coliform organisms isolated from the milk agar and blood plates. Of these, approximately 8 per cent of the total isolated gave positive reactions for fecal types of the organisms. There was little difference in this respect between the two kinds of milk. The organisms increase in numbers in the milks during the hot months but the proportional rise in Grade B does not seem to be greater than in Grade A (Chart IV).

COUNTS OF CLOSTRIDIA (B. WELCHII) SPORES

Another intestinal group commonly found in milk is *Clostridium,** often referred to as *B. welchii.* The presence of this organism was determined quantitatively by using 50 cc. of milk, previously heated to 80° C. for 10 minutes, inoculated into 50 cc. of Wilson-Blair agar in Kolle flasks. The organism in this medium gives rise to large, intensely black colonies. It will be noted that the count is not of vegetative cells but of spores. That the organisms as found in milk are largely in the spore form was indicated by a number of tests in which heated and unheated samples of the same milk were plated on the Wilson-Blair medium. The counts of black colonies for heated and unheated were substantially the same.

The results of the tests based on the procedure just given may be found in Tables 13 and 14. They show that Grade A milk is free of the organism 2 to 3 times more frequently than is Grade B. In the range of 1 to 5 colonies per 50 cc. the two are not very different, but the difference is large in

* *Bergey's Manual of Determinative Bacteriology* (5th ed.), 1939, p. 772.

the group of milks which produce more than 5 colonies per 50 cc. About 1.3 per cent of the Grade A samples were in this classification as against 15 per cent of the Grade B. The organism is clearly resistant to pasteurization.

tion. This is true especially since the organism does not grow in milk as long as free oxygen is present. Any organism found would therefore result from original contamination unless the conditions of handling were unusually bad.

TABLE 13

Distribution of Clostridia Counts

		Colonies per 50 cc. of Milk					
		0		*1–5*		*More than 5*	
	No. Samples Tested	*No.*	*%*	*No.*	*%*	*No.*	*%*
A raw	184	73	39.7	106	57.7	5	2.6
B raw	333	47	14.1	219	65.5	67	20.4
A pasteurized	219	104	47.6	114	52.4	1	0.05
B pasteurized	344	71	20.6	237	69.0	36	10.4

The distribution of counts by months reveals a seasonal variation in the numbers of clostridia present, as may be seen from Chart III.

It would appear that the organisms start to increase in both milks in July. A striking difference appears, however, in December where the Grade A counts decrease and the Grade B counts continue to rise until March.

Clostridium perfringens is so commonly found in fecal material that the extent of its occurrence in milk would seem to be one of the best available methods of calculating manurial pollu-

TABLE 14

Average Clostridia Spore Counts per 50 cc. for Each Grade by Months

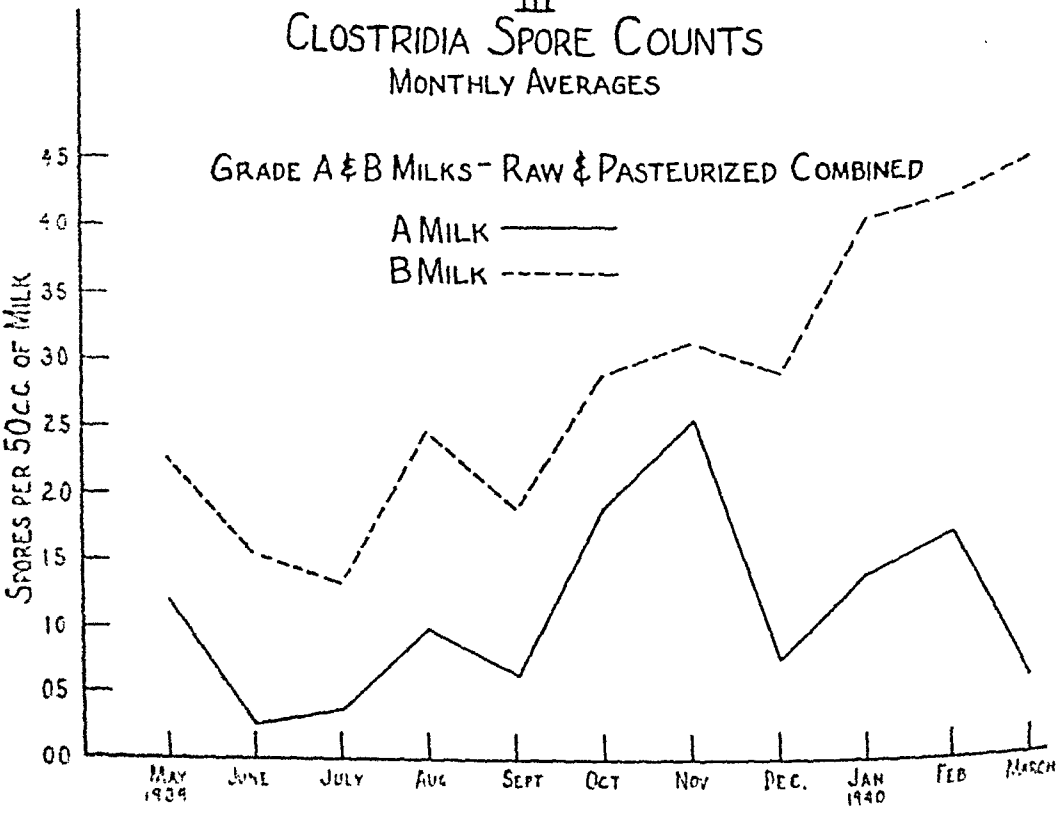
Month	*Grade A*	*Grade B*
May	1.2	2.3
June	0.3	1.53
July	0.38	1.34
Aug.	1.0	2.44
Sept.	0.63	1.9
Oct.	1.9	2.9
Nov.	2.53	3.1
Dec.	0.73	2.9
Jan.	1.4	4.04
Feb.	1.66	4.2
Mar.	0.56	4.3
Average	1.24	2.94

For the purpose of calculating the actual contamination of the milk a study was made of the clostridia content of manure. Four samples of fresh cow manure gave average clostridia spore counts of 500 and 2,000 organisms (spores) per gm. of wet and dry material respectively. Therefore, each organism represents on the average 0.002 gm. of wet manure and 0.0005 gm. dry. Since a total of 510 colonies were obtained from 20,500 cc. of Grade A milk tested, it follows that there were approximately 25 spores or 0.05 gm. of manure per qt. (0.01 gm. dry). With a production of 1,000,000 qt. per day, 50,000 gm. or 111 lbs. of fresh manure are brought into the city per day in Grade A milk. From 34,400 cc. of Grade B milk, 2,017 clostridia colonies were isolated. This is equivalent to 59 spores per qt., corresponding to 0.12 gm. of fresh manure. Per million quarts this would be 120,000 gm. or 267 lb. of fresh manure. At the present time about two-ninths of the milk supply labelled Grade B is actually produced on Grade A farms. If this correction were to be applied, 1,000,000 qts. of Grade B would, if derived only from Grade B farms, therefore, have a

III

CLOSTRIDIA SPORE COUNTS

MONTHLY AVERAGES



IV

VIOLET RED BILE AGAR COUNTS

MONTHLY GEOMETRIC MEANS

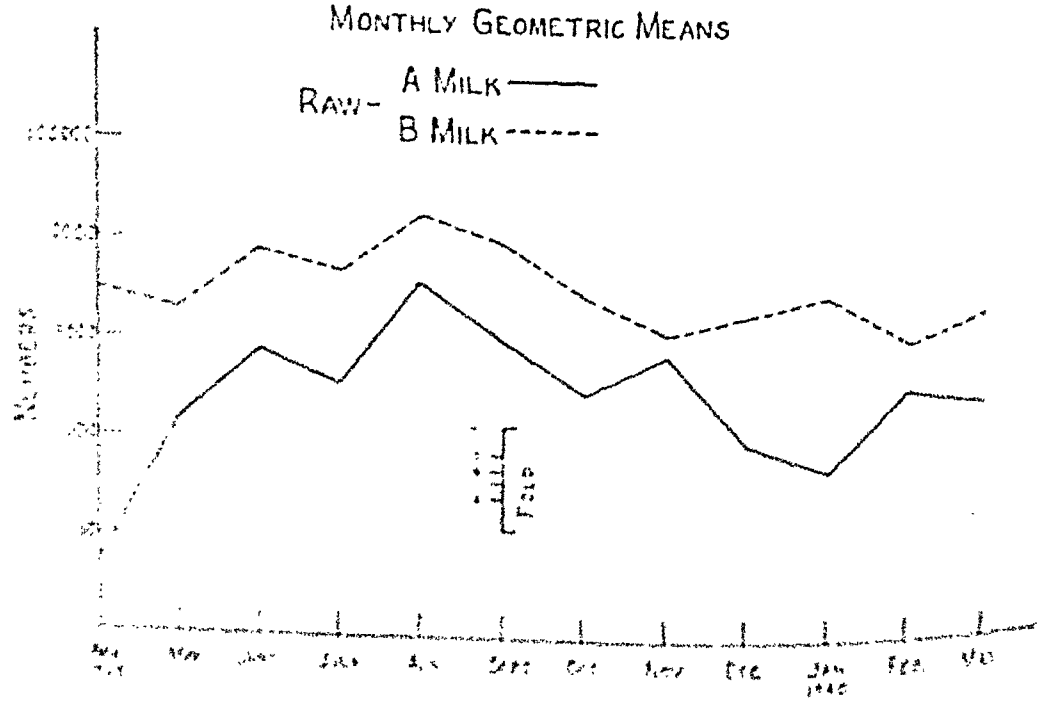


TABLE 15

Yeasts and Molds—Distribution of Counts Based on Counts in 0.1 cc. Samples of Milk

Grade	No. of Samples	Colonies 0–100 No.	0–100 %	101–1,000 No.	101–1,000 %	Over 1,000 No.	Over 1,000 %
A raw	185	128	69.1	44	23.8	13	7.1
B raw	341	167	49.0	88	25.8	86	25.2

Grade	No. of Samples	Colonies 0 No.	0 %	1–5 No.	1–5 %	Over 5 No.	Over 5 %
A pasteurized	231	149	64.5	68	29.4	14	6.1
B pasteurized	373	184	49.3	126	33.8	63	16.9

higher clostridia count which would correspond to 311 lbs. of manure for that volume of milk.

COUNTS ON SABOURAUD'S AGAR (YEASTS AND MOLDS)

Yeasts and molds were grown on Sabouraud's agar, which because of its high acidity prevents the growth of most bacterial forms. The results are presented in Tables 15 and 16. Incubation was for 4 days at 20° C. Portions of 0.1 cc. were plated on the agar, and the results are expressed on the basis of this volume.

From Table 15 it may be seen that lower counts predominate among Grade A raw samples, whereas in the high grouping (over 1,000 per 0.1 cc.) are found 25 per cent of the Grade B raw samples, and only 7 per cent of the Grade A.

Pasteurization destroys a very large percentage of the yeasts and molds, so that the counts are very much lower in samples which have been heated. Again the distribution in the low range, however, is proportionately about the same as in the raw milk and in the high range (in this case over 5 per 0.1 cc.)

TABLE 16

Geometric Means of Sabouraud Agar Counts (Yeasts and Molds) Raw Milks by Months (0.1 cc. Samples)

Months	Grade A Total	Grade A Molds	Grade B Total	Grade B Molds
Apr., 1939	...	...	500	
May	700	5.8	3,400	0.14
June	550	1.2	3,300	0.17
July	110	0.	4,300	0.26
Aug.	49	2.5	360	1.3
Sept.	43	0.	54	3.6
Oct.	30	6.2	60	9.3
Nov.	34	2.6	51	3.0
Dec.	25	5.6	68	1.9
Jan., 1940	49	3.6	71	2.0
Feb.	37	4.6	78	0.93
Mar.	25	4.3	80	3.2
Geometric mean of series	66	2.9	240	1.2

to be slightly higher in Grade A milk is probably due to the widespread use by Grade A dairies of lime phosphate powders which tend to dry the floor of the barn and therefore increase dust in the air. On the basis of the total counts there is a threefold difference between Grade A and Grade B production favoring Grade A milk.

Pollution by manure may next be considered. It is measurable by two of the tests employed, the clostridia spore count and the coliform count. The first organism probably does not grow after it gets into milk, the second is capable of multiplication and grows on the Standard Methods medium. The first organism does not sporulate in the presence of sugar, so that if growth occurs, vegetative cells are produced which would be killed by the 10 minute heating at 80° C. to which the milk is subjected before it is plated on the medium used in our experiments. The conversion of spore to vegetative cell probably does not take place in milk under average conditions since the organism multiplies only in the absence of free oxygen. The clostridia spore count, therefore, in all probability is the best measure of manurial pollution uncomplicated by variations in temperature and time of holding prior to pasteurization. It should be remembered, however, that the contamination need not be a direct one but may come from organisms which have spent a period on dust particles in the air.

The results show three things of interest: (1) "Grade A technic" of milk production is 3 times more effective than the "B technic" in excluding the organism from samples tested under similar conditions. In the prevention of high counts the A technic is 8 times more efficient than the B. (2) The distribution curve of the organism throughout the year varies with the two milks. It appears that while there is a general tendency for an increase in number of clostridia in both milks from July to September, a difference develops during the month of October, Grade B milks continuing to increase in counts, whereas Grade A milks begin to decrease in clostridia during this month. This is in spite of the fact that the cattle are stabled from this period on under conditions much more favorable (crowding and dust) to the contamination of the milk by this organism. (3) The fact that the organism is approximately as frequent in pasteurized as in raw milk shows the ineffectiveness of pasteurization as a means of destroying the organism.

The question of the significance of *Clostridia perfringens* is one concerning which the opinion of bacteriologists is still sharply divided, as it has been for many years. Its widespread occurrence in fecal material is used as an argument by some as a proof that the organism is harmless. On the other hand, there is some evidence that at least one outbreak of intestinal disorder was associated with the presence of *Clostridia perfringens*.[5] Very suggestive also is the experience with the disease known as "scours" or lamb dysentery.[6,7] This disease attacks lambs up to the age of 10 days, and is transmitted by milk, in two epidemics of which the causal agent has been definitely shown to be a clostridia organism of a distinct type but one not easily differentiated from the common kinds by the usual laboratory procedures. While there is apparently no human analogy to this disease, its possibility of occurrence should merit caution in declaring the *Clostridia perfringens* a harmless organism.

Clostridia perfringens and the other spore-forming organisms which find their way into milk can be controlled only by sanitary procedures since, as we have pointed out, the spores of these organisms are hardly if at all affected by pasteurization. It must also be remembered that the presence or absence

of such organisms is not indicated by the Standard Methods count.

The toxicity test performed on guinea pigs as described above discloses a defect in control of contamination not present in the technic of Grade A production but which appears occasionally in the warmer months in the production of Grade B milk. The nature of this defect can only be surmised. Some particular type of organism may be responsible or the cause of the reaction may be due to a combination of circumstances such as the presence of a number of different types of organisms which act upon milk at warm temperatures. Whether or not the toxic property for guinea pigs, which is developed in some Grade B milks, has any significance for humans, and in particular whether it corresponds to the toxic property of Park and Holt mentioned above, cannot be determined from the data of our study. The test is presented solely as one which distinguishes Grade A supply from Grade B supply of milk.

Pasteurization can be defined as the process which diminishes by a percentage, differing for each kind of organism, the number of living bacteria present in a given sample of milk. For such organisms as are the causative agents of human disease the percentage of reduction is very great, so great, in fact, that the chance of finding a living survivor in any given quart of milk is negligible. At the other extreme, however, we find the spore-forming organisms which in the state of sporulation are so resistant to pasteurization that one may expect to find little if any reduction in the count of viable organisms after the milk has been through pasteurization. Between these extremes lie most of the other species of organisms which find their way into the raw milk, some more and some less resistant. Practically nothing is known of the resistance of viruses to pasteurization.

The fact that pasteurization causes a geometric or percentage reduction in the number of living organisms means that with the organisms most vulnerable to heat a number of living survivors could be found after pasteurization, provided initial contamination is high enough. Let us consider an example based upon experimental findings with dysentery bacilli.

Twenty-five cultures of dysentery organisms were kept at a temperature of 145°F. in milk for 10, 20, and 30 minutes. The average initial number at the start of heating was 600,000,000. At the end of 10 minutes there were on the average 5,000 survivors, at the end of 20 minutes there were 600, and after 30 minutes no survivors. The average rate of reduction could be expressed by the ratio of $\frac{10,000}{1}$ for a 10 minute period of heating. For a 30 minute heating this becomes $\frac{1 \times 10^{12}}{1}$. If all the allowable count for Grade B raw milk (750,000) were made up of dysentery organisms there would be left after pasteurization $\frac{750,000}{1,000,000,000,000}$ organisms per cc., or one living survivor in every 1,300,000 cc. of milk. This is equivalent to one survivor per 1,300 qts., or the equivalent of approximately 300 contaminated quarts for the total city supply. A fully grown culture of dysentery organisms would leave possibly infective about 5,000 times this volume of milk. Under actual conditions, however, the number of dysentery organisms in the raw milk supply would be much less than either of the figures given, and one might expect to find few contaminated quarts of milk in the whole city supply in a period of a month or longer. The calculations show, however, that pasteurization, while a protective measure of considerable strength, is capable of being overtaxed by high initial pollution.

Throughout this paper there are a number of indications of the reduction in number of bacteria and other organisms, rather than of their complete elimination. Thus the ratios of the geometric mean counts of raw and pasteurized milk given in Table 6 show that on the average 2.1 per cent of the organisms survive for Grade A milks, and 5.3 for Grade B. The killing action of pasteurization is partly selective, but reference to Table 10 shows that in the main we are dealing with a percentage reduction since the same kinds of organisms are found in pasteurized milks as are present in raw. Yeasts and molds show a similar percentage reduction due to pasteurization. In Table 11 the distribution of counts of raw and pasteurized milks is about the same except that in the raw samples the counts are about 100 times greater. A similar picture is presented by coliform organisms except that in this case pasteurization leaves 10 per cent or less of the numbers of organisms originally present. Pasteurization therefore, while an essential safeguard for the safety of the milk supply is, as we have pointed out above, only a partial correction for defects in farm sanitation.

CONCLUSIONS

1. Agar plate counts of Grade A milk, by Standard Methods, gave monthly median values ranging from 22,000 to 300,000 for the raw, and from 450 to 2,400 for the pasteurized product. The range of Grade B milks, by the same methods, was from 160,000 to 860,000 for the raw, and 8,400 to 21,000 for the pasteurized. Use of the newly adopted official agar raised the counts of most samples of milk and increased considerably the number of samples of Grade B milk with counts in excess of the limit allowed by the present Sanitary Code of New York City.

2. The distribution of counts for each kind of milk shows that Grade A milk is a more uniform and cleaner product than Grade B milk.

3. Pasteurization appears to produce a greater reduction in the numbers of living organisms in Grade A milk than in Grade B.

4. The bacterial flora of both grades of milk is qualitatively much the same. The predominating organisms are streptococci of the viridans type and staphylococci.

5. Bacteria of the coliform group are significantly more numerous in Grade B raw milk than in Grade A raw. Bacteria of this type are much less numerous in both grades of pasteurized milks, samples of Grade B milk showing somewhat higher counts than do samples of Grade A.

6. Spores of the anaerobe *Clostridia perfringens* are more frequently found in Grade B than in Grade A milk. As the organism in the spore stage is not much affected by pasteurization, little difference was noted between the occurrence of these bacteria in the raw and the pasteurized milks of both grades.

7. Yeasts are much more numerous in Grade B raw milk than in Grade A raw. Molds are more numerous in Grade A milks. In the pasteurized milks, both counts are low and do not appear to be significantly different.

8. In a small number of instances samples of Grade B milk, allowed to stand for 2 days at room temperature, developed a toxic property not affected by repasteurization. The toxic effects could be demonstrated by interperitoneal injections of the milks into guinea pigs. This property did not develop in samples of Grade A milks similarly treated.

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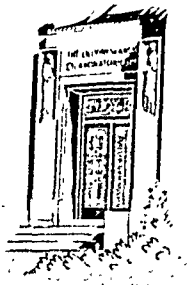
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American Journal of Public Health
and THE NATION'S HEALTH

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American Journal of Public Health
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Volume 30 October, 1940 Number 10

The Problem of Back Flow Preventive Measures Employed at the New York World's Fair

ROBERT J. GLEASON, M.S.C.E.

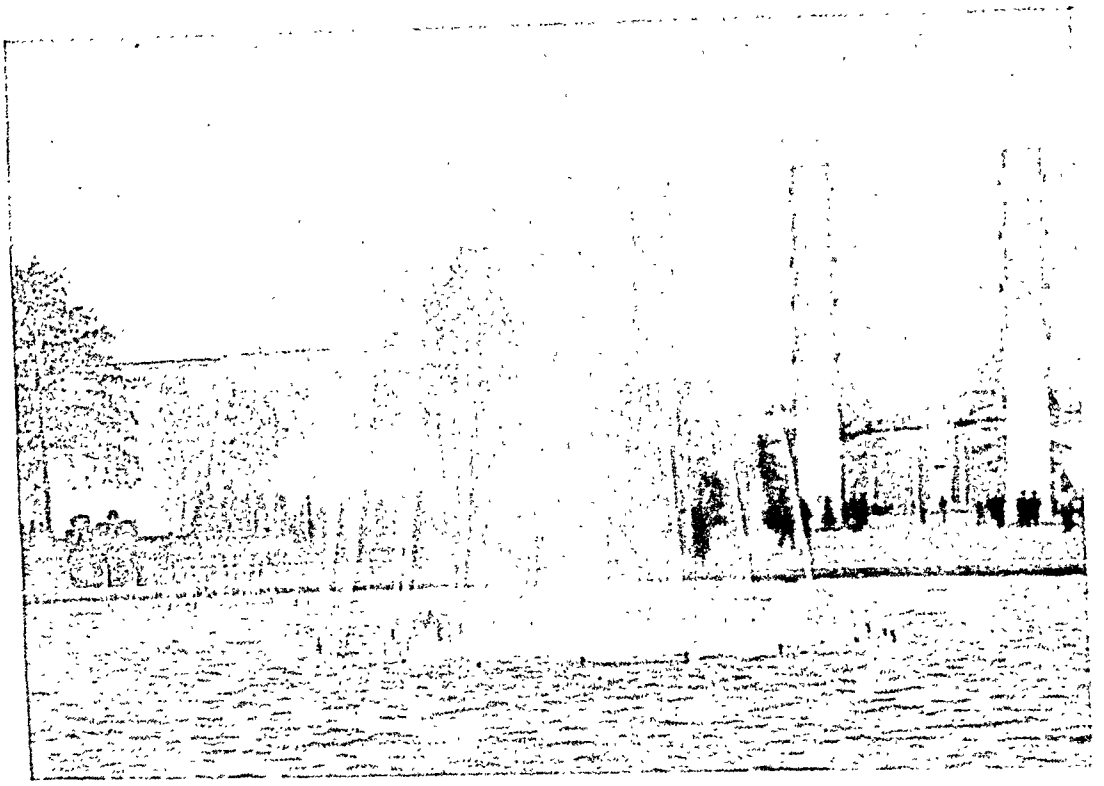
Sanitary Engineer, New York World's Fair, Department of Health, New York, N. Y.

MUCH has been written in recent years concerning the possibility of contaminating the water supply as the result of back-siphonage or back flow in plumbing systems. Many surveys have been made for the purpose of uncovering and eliminating interconnections between water distribution and plumbing systems which are hazards to the safety of the water supply because they may permit the back flow of wastes when abnormal conditions occur in the piping systems.

One of the most comprehensive of these surveys was that made by the U. S. Public Health Service and the Works Progress Administration in 1936 and 1937. More than 800 buildings in New York City and approximately 100 buildings in Detroit, Mich., were inspected for cross-connections and interconnections as well as other faulty plumbing.[1] This survey and many others were prompted by the severe water-borne outbreak of amebic dysentery in Chicago in 1933 which resulted in at least 1,409 cases of the disease with 98 or more fatalities.[2] The epidemic was attributed directly to interconnections in the plumbing systems of two hotels which permitted the back flow of sewage into the water distribution systems.

A more recent plumbing-borne outbreak of disease which again emphasized the necessity for providing adequate protection against back flow is that which occurred in a laboratory building on the campus of Michigan State College in East Lansing, Mich., during December, 1938, and January, 1939.[3, 4] Here again some 80 cases of brucellosis, resulting in one student death, were attributed to a contaminated water supply caused by back flow into the water distribution system.

Despite these continued plumbing-borne outbreaks of disease and the many excellent surveys made to discover and eliminate faulty plumbing, only a limited amount of information has as yet found its way into the literature concerning what is being done in actual practice to protect water distribution



GOOSENECK INLET TO DISPLAY FOUNTAIN AND POOL

An accepted method of supplying a display fountain and pool is illustrated by the gooseneck inlet in the picture. The 4 inch inlet from the domestic water supply is not only well above the water level in the pool but is also above the topmost rim of the pool so that it cannot become submerged under any circumstances.

The numerous fountain nozzles are part of a separate recirculating system which is supplied directly by the water in the pool. There is no connection whatever between the domestic water supply and the fountain recirculating system.

systems against back flow. Many rules and regulations prohibiting cross-connections and interconnections have been formulated and adopted by various states and cities, but the extent to which these regulations are being enforced is too little known. Hence, it is the purpose of this paper to attempt to stimulate further contributions concerning the efforts being made and the accomplishments achieved toward the protection of the water supply against contamination as the result of back flow.

PREVENTIVE MEASURES AT THE NEW YORK WORLD'S FAIR

The building of the New York World's Fair provided an excellent opportunity to apply the provisions of the New York City *Building Code* pertaining to the prevention of back flow to new construction work. It was decided at the outset that the many water systems at the Fair must be adequately protected against contamination from back flow in practical compliance with the spirit of building the "World of Tomorrow." In other words, no precautions were to be overlooked in safeguarding the water supply for the millions of persons from all over the world who were to visit the Fair.

The enforcement of the requirements relating to back flow was assumed by the World's Fair Department of Health in fulfillment of its responsibility for the protection of the water supply against contamination. The regulations providing for the protection of the water supply were found in the following two general requirements of the *Building Code:*

1. Every structure intended for human occupancy shall be provided with a supply of pure and wholesome water, neither cross-connected with unsafe water supplies nor interconnected to any drainage system.

2. Wherever the supply to a fixture is introduced into the fixture below the overflow level the supply shall be protected with an approved vacuum breaker which will prevent the siphoning of water from the fixture into the supply piping.

These two relatively simple requirements when properly interpreted were sufficient to cover adequately every plumbing problem involving back flow encountered at the Fair.

EXAMINATION OF PLUMBING PLANS

A systematic check of the building plans and all other plans involving plumbing work, such as for display fountains and water spectacles, was made in accordance with regulations of the *Building Code* mentioned above. Copies of all plumbing plans were submitted to the Department of Health and carefully examined for plumbing hazards. These deficiencies included cross-connections between the city water supply and unsafe recirculated fountain and pool supplies, such as pump priming or submerged pool connections; interconnections between water and waste systems, either direct or by way of various water cooled equipment; and submerged inlet fixtures including water closets, urinals, flush tanks, make-up tanks, dishwashers, steam tables, and other kitchen equipment. Other violations of the plumbing code, not pertaining to back flow but considered to be health hazards, in addition to dangerous locations of exposed soil and waste lines above kitchens or other rooms where food is handled, were also listed for correction.

DRINKING FOUNTAINS

Particular attention was paid to the design of drinking fountains. Although a poorly designed drinking fountain cannot be classified as a plumbing violation unless it is constructed with a submerged inlet or is not provided with a trap, the fountain may easily be a factor in the transmission of disease and hence must be considered along with other plumbing fixtures.

Thus a fountain with a vertical jet allows water from the mouth of the



DRINKING FOUNTAIN

The picture illustrates one of the drinking fountains accepted for use at the World's Fair. Note especially the nozzle set above the edge of the bowl so that it will not be submerged should the drain of the fountain become clogged and allow the bowl to fill with water. Note also the non-oxidizing guard to prevent the mouth and nose of persons using the fountain from coming into contact with the nozzle.

The jet of water issues from the nozzle at an angle so that the mouth of the user is to the left of and not directly above the guard and the water inlet. In this way water from the mouth of the person using the fountain falls into the bowl rather than back upon the inlet and the guard, and thus reduces to a minimum the possibility of transmitting infection from one individual to another.

The "Essential Features in the Design of Sanitary Drinking Fountains" as adopted by the American Public Health Association were used as a guide for the acceptance of all drinking fountains installed at the Fair.

person using the fountain to fall back upon the orifice from which it issues, so that any disease organisms from the mouth of that person may be transmitted to the next one drinking at the fountain. In order to eliminate this fault in design, the nozzle of the fountain should be set at an angle from the vertical and should be protected by a non-oxidizing guard so as to prevent the mouth of the user from contaminating the nozzle directly. In addition, the guard should be so designed as to reduce to a minimum the possibility of transmission of infection by touching the guard.

The "Essential Features in the Design of Sanitary Drinking Fountains" [5] as adopted by the American Public Health Association were used as a guide for the approval of drinking fountains installed at the New York World's Fair.

Diagrams of drinking fountains with self-contained refrigerating units were required since many of these units are equipped with water cooled condensers and hence must be provided with an indirect waste connection. The usual practice in making these installations is to connect a small branch from the water line supplying the fountain to the condenser unit, and thence to connect the cooling water waste line directly to the drain, thereby creating a very dangerous inter-connection between the water distribution and the waste systems.

LETTERS TO CONTRACTORS

As each set of plans was examined the plumbing deficiencies were listed and a letter of notification was sent to the contractor or other responsible authority. The letter called attention to the fact that the safety of the water supply on the Fair grounds was a direct responsibility of the Department of Health, and those sections of the *Building Code* pertaining to the protection of the water supply were quoted in full. Following the explanation, the plumbing deficiencies which could lead to the contamination of the water supply were listed and the proper method of correction indicated for each deficiency.

Since many of the building plans examined contained violations similar in character and manner of correction, a representative list of "Requirements for the Protection of the Water Supply against Contamination as the result of Back Flow" was prepared. The "Requirements" were divided into two groups: those pertaining to plumbing in all buildings, and those pertaining in particular to kitchen equipment. The list of "Requirements" pertaining to all buildings included the following:

1. All flush valve supplied fixtures with submerged inlets such as water closets and urinals must be equipped with an approved vacuum breaker so installed as to prevent back flow from the fixture into the water distribution system.

2. Flush tanks with ballcock controlled supplies must be equipped with an approved anti-siphon inlet which shall be set at least 1 inch above the overflow outlet of the flush tank.

3. Ballcock controlled inlets to water reservoirs of air washers, dehumidifiers, economizers, make-up tanks, etc., must be properly protected against back flow. This is accomplished most effectively by elevating the inlet so that it will be at least twice the diameter of the inlet above the highest possible water level in the fixture considering the overflow to be clogged so as to be ineffective. If the inlet cannot be properly elevated, then an approved vacuum breaker must be installed in the supply line at a point at least 6 inches above the topmost rim of the water reservoir.

4. Water supply inlets to lavatories, sinks, and all other fixtures shall be located at least twice the diameter of the inlet above the topmost rim of the fixture. Where a submerged inlet is absolutely essential to the proper functioning of a fixture, an approved vacuum breaker must be installed in the supply line at a point at least 6 inches above the topmost rim of the fixture.

5. Indirect waste connections must be provided from water cooled condensers of air conditioning and refrigeration units. The waste line from the unit must be terminated at a distance of not less than two pipe diameters above the topmost rim of the open

waste receptacle into which it discharges. Condenser water may not be re-used for domestic purposes under any circumstances.

6. Direct connections of the city water supply to recirculating pumps, sump pumps, or similar purpose pumps are prohibited. Where water connections are absolutely essential for priming or other purposes, the water connection must be made to the suction side of the pump and an approved vacuum breaker and check valve must be properly installed in the supply line not less than 6 inches above the highest point in the pump circulating system.

7. Pool and fountain inlets must be adequately protected against back flow. In general, the supply must empty into the pool at a distance of not less than twice the diameter of the supply line above the topmost rim of the pool.

8. All drinking fountains must comply with the "Essential Features in the Design of Sanitary Drinking Fountains" as adopted by the American Public Health Association.

In addition to the above regulations, another list of "Requirements for the Protection of the Water Supply against Contamination as the result of Back Flow" with particular reference to kitchen equipment included the following items:

1. Over rim inlets must be provided in dish and glass washing machines. Many of the latest models of these machines are still constructed with submerged inlets through which contaminated water from the machines may readily be siphoned back into the water distribution system. (Any inlet which is below the highest possible water level in the machine, considering the overflow line to be clogged so as to be ineffective, is a submerged inlet.) This defect may be corrected by providing goose neck fillers which empty into the water reservoirs in the machines at least 1 inch above the highest possible water level as defined above.

2. Steam tables and bain-maries are also commonly constructed with submerged inlets below the topmost rim of the water receptacle. This defect may be corrected by providing a goose neck filler emptying into the water receptacle from a point not less than 1 inch above the topmost rim of the fixture.

3. Disher vats with submerged inlets are also unacceptable. These must also be provided with goose neck fillers as for the steam tables.

Copies of the "Requirements" were enclosed in each letter listing the plumbing deficiencies thereby avoiding much duplication of work.

INTERVIEWS

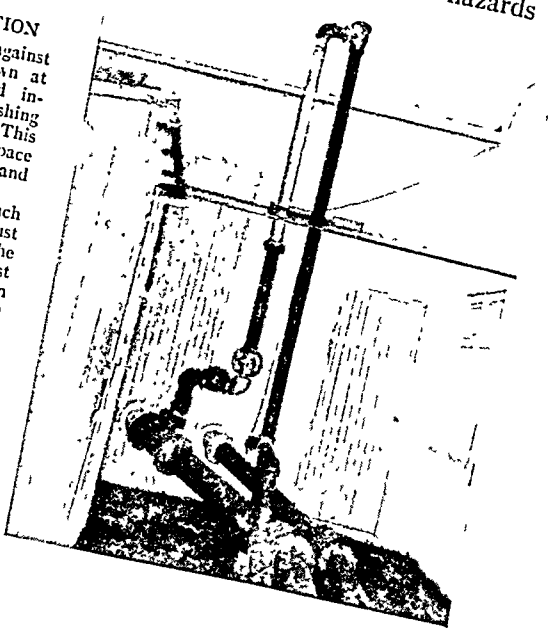
Upon receipt of the letter concerning the plumbing deficiencies many of the contractors and plumbers made arrangements for interviews both in the office and in the field. Many of them were totally unfamiliar with the hazards of

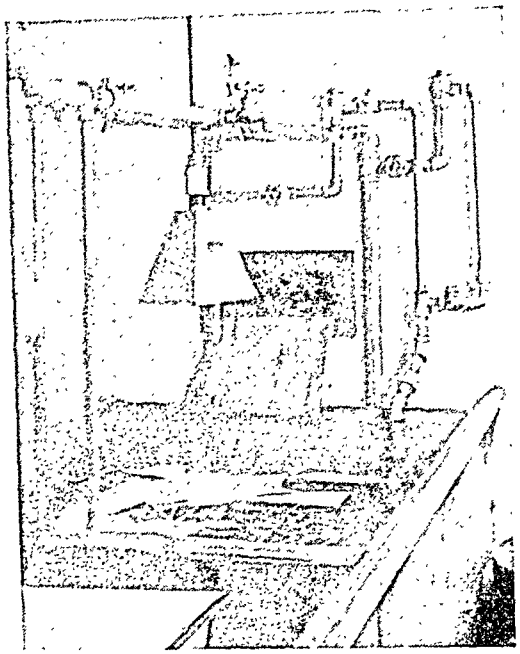
AQUACADE SWIMMING POOL CONNECTION

In order to safeguard the city water supply against contamination, the 4 inch vacuum breaker shown at the top of the loop was especially made and installed on the city water connection for back-washing the swimming pool filters at the Aquacade. This installation was necessary because of a lack of space required for a separate over rim supplied tank and pump to back-wash the filters.

The 4 inch city supply is connected into the 8 inch suction line to the pool recirculating pump just ahead of the pump which is located inside the doorway. The vacuum breaker is mounted at least one foot above the highest point in the filtration system (indicated by the roof level in the picture) so that under no circumstances will there be any static back pressure which would tend to keep the seat of the vacuum breaker in a closed position. The check valve just ahead of the gate valve provides another safeguard against the same possibility.

Note that the gate valve is placed on the discharge side of the vacuum breaker and must be closed when the pool recirculating pump is in operation, otherwise air will be sucked in through the vacuum breaker and the pump will lose its prime.





PHOTOGRAPHER'S DEVELOPING SINK

Many developing sinks as the one shown in this picture contain a submerged rim spray water supply. In all such installations the domestic supply must be protected against possible contamination as the result of back flow of any of the various developing mixtures from the sink into the water system. This has been accomplished by the installation of vacuum breakers and check valves in the hot and cold water lines supplying the submerged rim spray entering at the right hand corner of the sink.

cross-connections, interconnections, submerged inlets, and deficient fixtures, and even more so regarding the regulations of the *Building Code* prohibiting these hazards which had been in force since January 1, 1938. After the reasons behind these regulations had been carefully explained, however, very good coöperation was obtained.

As usual, there were some who stubbornly resisted the changes required, thinking only of the extra expense involved without considering the possible dangers to the safety of the public health which existed because of the plumbing deficiencies. They were the ones, however, who had taken it for granted that positive pressure always exists in water systems. When it was demonstrated to them that there would be times when there was no pressure or even a negative pressure (vacuum) under adverse operating conditions in water distribution systems, even these few admitted the necessity and wisdom of the *Code* regulations providing for the protection of the water supply against all possible contingencies. The slight extra expense involved in most cases was negligible in contrast to the factor of safety added to the protective measures taken to preserve the public health of the millions of visitors to the Fair.

By way of contrast, some of the plumbers became "vacuum breaker minded" as evidenced by a number of unnecessary installations observed during subsequent plumbing inspections.

The plumbing deficiency letters did not always bring forth response from the contractors. In these instances, the plumbers were contacted directly in the field and the plumbing deficiencies pointed out to them together with the attendant hazards to the safety of the water supply. Very often this was all that was necessary to bring about compliance with the *Code* requirements. In other cases it was necessary to delay acceptance of the plumbing installation by the Department of Health until the necessary corrections had been made.

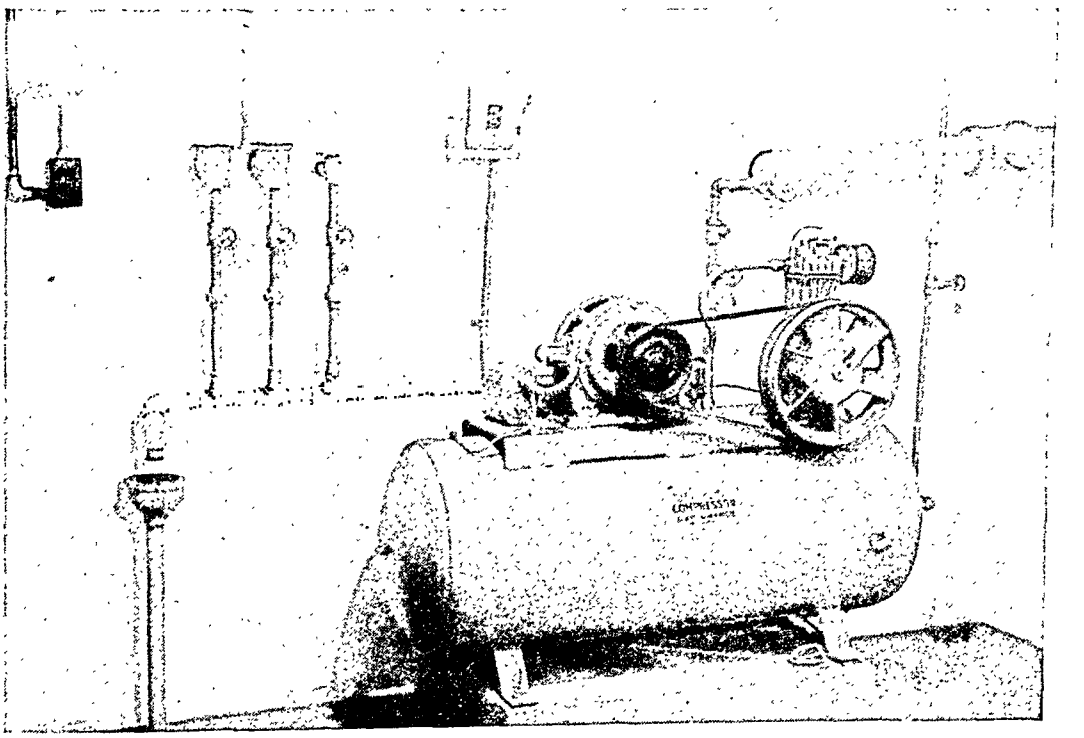
FIELD INSPECTION

As previously mentioned, field inspection of the plumbing was maintained during all stages of the construction period. This procedure was absolutely necessary because of the constant revision of plans and changes in equipment for one reason or another. Also, the installation of vacuum breakers and other protective devices was a new experience to many of the plumbers so that the proper manner of installation was not always clearly understood. Thus, vacuum breakers were placed in the water lines upside down, sideways, and below the overflow level of the fixtures they were meant to protect from back flow. This was done usually because of a lack of knowledge concern-

ing the construction and operation of the vacuum breaker. Many looked upon it as a new device similar to a pressure relief or blow-off valve when in reality the vacuum breaker is constructed to relieve the effects of a lack of pressure rather than an excess of pressure.

Besides the vacuum breaker, another protective device which was constantly rendered ineffective is the indirect waste connection required for various water cooled equipment. It was readily understood that an open waste was necessary but usually the cooling water waste line was then submerged in the open funnel or other waste receptacle into which it discharged. The necessity of providing a safe air gap between the end of the cooling water waste line and the top rim of the open waste receptacle was not recognized.

Even after the buildings were completed constant re-inspection of the plumbing was required. Many of the building superintendents and maintenance men who were placed in charge of the buildings after completion were unfamiliar with the protective devices and installations. As a result, vacuum breakers were removed because they leaked and were not replaced or properly repaired; indirect waste lines were extended down into open drain receptacles in order to prevent splashing instead of providing a loose protective shield; over rim inlets were often nullified by connecting a piece of rubber

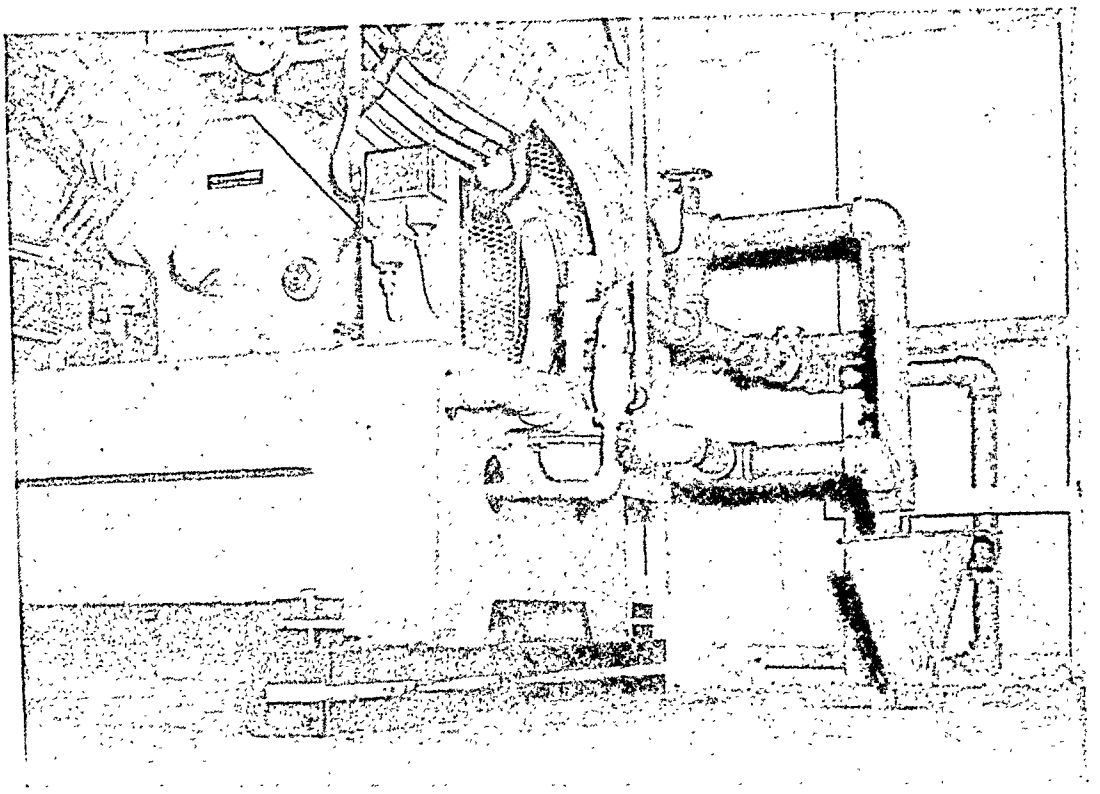


INDIRECT WASTES

At the left of the picture may be seen three drip lines for draining the cold water, the hot water and the hot water recirculating systems of the building. An accepted method of wasting these lines into an open funnel is illustrated. This arrangement eliminates the possibility of contaminating the domestic water system as the result of back flow which might occur if the drip line were directly connected to a drain or sewer line.

At the rear of the compressor unit may be seen another drip line from the fire system which carries the same water supply as the domestic system. This drip also connects into the 1¼ inch drain leading to the open funnel waste. Note that the drain empties into the funnel well above the top rim.

The air compressor unit shown has no water connection.



WATER COOLED AIR-CONDITIONING UNIT

This picture illustrates a water cooled air-conditioning unit properly installed so as to protect the water supply against possible contamination. The unit is supplied with water through the 1½ inch valved line emerging from below the floor between the studding in the right background. Installed on the water line between the valve and the unit may be seen a check valve (visible behind waste line from relief valve to funnel) and a pressure relief valve, as required by the New York City Building Code.

The waste line from the water cooled condenser of the air-conditioning unit empties into the open funnel at a safe distance above the top rim. Note the waste cooling water discharging above the funnel.

hose to the inlet which was then submerged below the top rim of the fixture. Other similar instances too numerous to mention were also noted and subsequently corrected.

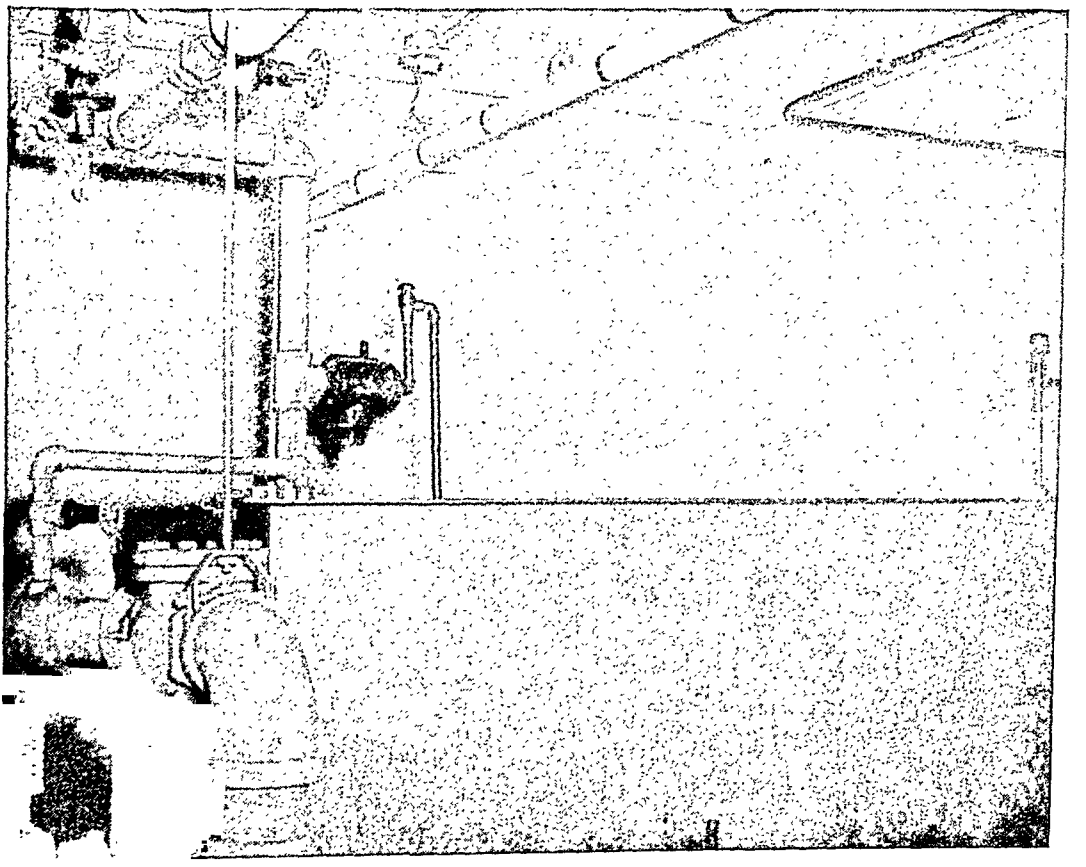
Besides these periodic re-inspections new construction and alteration work requiring constant inspection continued throughout the 6 month operating period of the season. Much follow-up work was necessary in checking back on the correction of plumbing deficiencies of which the various exhibitors and concessionaires had been notified by letter. In many cases the changes were made directly by the building maintenance men, and in other cases the plumbers, air-conditioning contractors, equipment manufacturers, or others were required to make the corrections so that their work was in compliance with the plumbing code. This was possible by reason of the fact that most of the contract specifications stated that all work must comply with the New York City *Building Code.*

Although there was much opposition at first to the strict enforcement of all plumbing code requirements relating to the protection of the water supply, as the reasons behind the regulations were pointed out the measure of coöperation on the part of architects, engineers, and especially the plumbers increased steadily. During the final three or four months before the opening of the Fair, the rush was so great to complete the work by opening day that many deficiencies were neglected so that correction was necessary after the plumbing

work had been completed. Since letters listing the plumbing violations had already been sent to the various building contractors, follow-up letters were again sent wherever re-inspection indicated that the plumbing corrections had not been made.

NUMBER OF PLANS EXAMINED

A total of 483 different sets of building and exhibit plans were examined by the Sanitary Division of the World's Fair Department of Health for cross-connections, interconnections, submerged inlet fixtures, and other plumbing deficiencies. The types of plans examined for each building or exhibit included water distribution systems, soil, waste, and storm water drainage systems; heating, refrigerating, and air-conditioning systems; display fountain recirculating systems; kitchen and laboratory fixture layouts, and cross-section diagrams of air-conditioning units, re-



MAKE-UP TANK

Tanks for supplying make-up water to pools, fountains, and other displays using a recirculated supply of water are often installed with a submerged ballcock inlet. Obviously, such submerged inlets are an ever present hazard to the safety of the domestic water supply, especially when the recirculated water is used in outdoor pools and fountains where it is subject to many possibilities of contamination.

The tank shown in the picture supplies make-up water for a series of fountains and pools served by a single recirculating system. The 2 inch inlet is mounted 4 inches above the top-most rim of the tank so that there is no possibility of back flow of the unsafe water in the tank into the domestic supply. The ballcock control is mounted on the bottom of the ½ inch pipe which loops upward and then down into the tank from the right side of the 2 inch inlet. Note the vacuum breaker at the top of the loop as shown to protect the submerged control line.

The isolation of the domestic water supply from the make-up tank water was doubly important in this instance not only because of the chances of contamination of the recirculated water in the outside fountains and pools, but also because the water was heavily dosed with copper sulphate to give it a blue color and to control algae growths.

The 1 inch valved line extending into the tank at the front left hand corner is from the recirculating system and hence needs no protection.

NEW YORK WORLD'S FAIR

DEPARTMENT OF HEALTH

X-Y-Z Building — District #6 — Location R-1

X-Y-Z Restaurant — PLUMBING SURVEY — Date 10-19-39

KITCHEN EQUIPMENT	NO.	CHECK VALVE NO.	CHECK VALVE SIZE	VACUUM BREAKER NO.	VACUUM BREAKER SIZE	OVER RIM INLET CM.	OVER RIM INLET F.	INDIRECT WASTE	REMARKS
Dishwashers	1					2		Yes	To grease trap
Glass Washers	1						1	Yes	
Bain-Maries	1						1	Yes	Hand filled
Soup Kettles	1	1	1/2				1	Yes	
Steam Tables	1						1	Yes	
Fisher Vats	1							Yes	
Coffee Urns	1	1	3/4					Yes	
Potato Peelers	1	1	1/2					Yes	
Sinks	9						9	Yes	2 sinks to grease trap
Hot Water Tanks	1	(Also 1 steam boiler)						Yes (2)	Relief to funnel
Bar sinks	2							No	
TOTALS	20	3	-	-	-			19	

REFRIGERATING UNITS (WATER COOLED)	NO.	CHECK VALVE NO.	CHECK VALVE SIZE	VACUUM BREAKER NO.	VACUUM BREAKER SIZE	RELIEF VALVE NO.	RELIEF VALVE SIZE	INDIRECT WASTE	REMARKS
A-B-C units	2	No						Yes	No check valves
TOTALS	2							2	

AIR CONDITIONING UNITS (WATER COOLED)	NO.	CHECK VALVE NO.	CHECK VALVE SIZE	VACUUM BREAKER NO.	VACUUM BREAKER SIZE	OVER RIM INLET CM.	OVER RIM INLET F.	INDIRECT WASTE	REMARKS
Compressor - Condenser Type									
See Building									
TOTALS									

TOILET ROOM FIXTURES		FLUSH VALVES W. C. NO.	FLUSH VALVES W. C. V.B.	FLUSH VALVES URINALS NO.	FLUSH VALVES URINALS V.B.	FLUSH TANKS W. C. NO.	FLUSH TANKS W. C. V.B.	FLUSH TANKS URINALS NO.	FLUSH TANKS URINALS V.B.	LAV. OVER RIM INLETS	REMARKS
PUBLIC TOILETS	Men	2	2	2	-					2	Stall type urinals
	Women	3	3							2	
FOOD HANDLERS TOILETS	Men	3	3	2	2					2	2 Showers
	Women	3	3							2	2 Showers 1 S.S.
TOTALS		11	11	4	2					8	

Overhead Soil or Waste Lines	No.	How Protected
Location: None		

SUMMARY	CHECK VALVES	VACUUM BREAKERS	RELIEF VALVES	OVER RIM INLETS	INDIRECT WASTES	Fl. V. W. C.	V. B. CR.	Fl. T. W. C.	V. B. CR.	
TOTAL NO.	3	-	2	23	21	11	2	-	-	R.J.G.

NEW YORK WORLD'S FAIR 1939 INCORPORATED

DEPARTMENT OF HEALTH

X-Y-Z Building — District #6 — Location R-1

PLUMBING SURVEY — Date 10-19-39

WATER INLETS	NO.	CHECK VALVE NO.	CHECK VALVE SIZE	VACUUM BREAKER NO.	VACUUM BREAKER SIZE	OVER RIM INLET CM.	OVER RIM INLET F.	INDIRECT WASTE	REMARKS
Pools	1	Not in operation - water line disconnected.							
Fountains	1						1	Yes	Cooling tower make-up tank
Make-up Tanks	1								Cooling tower recirc. pump
Pumps (Priming)	(1)	Self-primed						Yes	In bsmt. Relief o.k.
H. W. Tanks	1								
Sinks	1						1	Yes (1)	In bsmt. Takes ind.waste line from kitchen fixtures
Sump (In refrig. room)		Drips from city water						Yes (2)	and fire systems terminate above sump.
TOTALS	4						1	5	

REFRIGERATING UNITS (WATER COOLED)	NO.	CHECK VALVE NO.	CHECK VALVE SIZE	VACUUM BREAKER NO.	VACUUM BREAKER SIZE	RELIEF VALVE NO.	RELIEF VALVE SIZE	INDIRECT WASTE	REMARKS
See Restaurant									
TOTALS									

AIR CONDITIONING UNITS (WATER COOLED)	NO.	CHECK VALVE NO.	CHECK VALVE SIZE	VACUUM BREAKER NO.	VACUUM BREAKER SIZE	OVER RIM INLET CM.	OVER RIM INLET F.	INDIRECT WASTE	REMARKS
Compressor - Condenser Type	2	(Compressors air cooled - condensers cooled by water from							
		(recirc. supply from cooling tower - see above.							
Chilled water system		1	2"	1	2"	Direct make-up connection - city water.			
TOTALS	2	1		1					

TOILET ROOM FIXTURES		FLUSH VALVES W. C. NO.	FLUSH VALVES W. C. V.B.	FLUSH VALVES URINALS NO.	FLUSH VALVES URINALS V.B.	FLUSH TANKS W. C. NO.	FLUSH TANKS W. C. V.B.	FLUSH TANKS URINALS NO.	FLUSH TANKS URINALS V.B.	LAV. OVER RIM INLETS	REMARKS
PUBLIC TOILETS	Men	10	10	8	8					7	1 S.S.
	Women	13	13							7	1 S.S.
PRIVATE TOILETS	Men	4	4	3	3					4	4 Showers
	Women	4	4							4	1 S.S.
TOTALS		31	31	11	11					22	

DRINKING FOUNTAINS	NO.	INLET	COLD	CHECK VALVE NO.	CHECK VALVE V.B.	VACUUM BREAKER NO.	VACUUM BREAKER V.B.	INDIRECT WASTE	REMARKS
Fountain Type									
Cooler Type	4	CK	CK					No	Air cooled units.
TOTALS	4								

SUMMARY	CHECK VALVES	VACUUM BREAKERS	RELIEF VALVES	OVER RIM INLETS	INDIRECT WASTES	Fl. V. W.C.	V.B. CR.	Fl. T. W.C.	V.B. CR.	
TOTAL NO.	1	1	1	24	5	31	11	-	-	R.J.G.

frigerating units, and other special equipment.

Three hundred and eleven plumbing letters were sent to contractors relative to changes and corrections. In some instances two or three letters were required before any response was obtained, and in many cases it was necessary to contact the responsible authorities in the building before any action was taken.

TYPICAL PLUMBING INSTALLATIONS

Some typical examples of protective devices and methods used in safeguarding the water supply at the New York World's Fair against contamination as the result of back flow are shown in the accompanying illustrations.

PLUMBING SURVEY

During the last two months of the Fair season a systematic check-up of the plumbing in every building was made. All fixtures supplied with water were recorded for each building together with the protective devices employed for the prevention of back flow. The plumbing survey revealed many changes which had been made subsequent to the original work as well as many new installations of additional air-conditioning and refrigerating units. All changes or additions which did not comply with the necessary requirements of the *Code* were marked for correction.

In order to facilitate the survey work, form sheets on which the number and type of all fixtures could readily be entered were used. Two types of form sheets were drafted, one for restaurant equipment and the other for general building equipment including pumps, make-up tanks, fountains and the like. Space is also provided on both sheets for recording refrigerating units, air-conditioning units, toilet room fixtures, and finally, a summary of all protective devices for the building or establishment (see sample Plumbing Survey sheets).

The survey has provided a permanent record of the plumbing for each building and, incidentally, it revealed the number of possible points at which contamination of the water supply could occur without proper protection. This record will prove invaluable in rechecking the plumbing systems and fixtures when the buildings are re-opened for the 1940 season. Some idea of the magnitude and scope of the survey may be gained by the summary of fixtures, equipment, and protective devices installed in the buildings, exhibits, and displays on the site of the World's Fair (Table 1).

SUMMARY

The assumption of the responsibility for examining all plumbing plans for new construction in order to eliminate all possible sources of contamination of the water supply represents a modern trend in the conception of the duties of the Department of Health. It is true that numerous inspections are made to uncover and to eliminate faulty plumbing in buildings already completed, but the idea of assuming the initiative for eliminating plumbing hazards before they are constructed in order to save expensive alterations and replacements is still unique in the experience of a health department. It represents a distinct and valuable service rendered both to private interests including architects, engineers, and contractors on the one hand, and to the general public on the other in instituting a more efficient and effective means of attacking one of the major public health problems, namely, that of safeguarding the water supply against accidental pollution.

While constant inspection for plumbing deficiencies in hospitals, institutions, hotels, industrial plants, apartment houses, and other buildings should be carried on by the health department, it seems that a very effective preventive measure is being overlooked in not pro-

TABLE 1

PLUMBING SURVEY SUMMARY

Toilet Room Fixtures		
Water closets		
Flush valve	3,649	
Flush tank	146	
Total		3,795
Urinals		
Flush valve	1,241	
Flush tank	15	
Total		1,256
Lavatories		
Total		2,520
Air-Conditioning Units		
Water-cooled condenser units	176	
Evaporative condenser units	41	
Air-cooled units	35	
Total		252
Refrigeration Units		
Water-cooled condenser units	217	
Evaporative condenser units	2	
Air-cooled units	73	
Total		292
Drinking Fountains		
Outside fountains	328	
Inside fountains	205	
Total		533
Protective Devices		
Vacuum breakers		
Flush valve	4,673	
All other	111	
Total		4,784
Anti-siphon inlets		
Flush tanks	139	
Over rim inlets		
Lavatories	2,520	
All other fixtures	2,373	
Total		4,893
Indirect wastes		
Total		1,368

viding for the examination of all plumbing plans for new construction work. In this way, many violations may be prevented or corrected in the planning stage. Likewise, the detection of plumbing deficiencies on the plans may be accomplished much more quickly and effectively than by subsequent field inspection after the plumbing is installed and either partially or wholly enclosed in the walls and ceilings of a building. However, plans are oftentimes altered during construction for various reasons so that subsequent inspection is always necessary both for checking the plumbing system and to see that corrections are made and that required protective devices are properly installed.

The authority for investigating the safety of the plumbing in buildings is vested in the Department of Health by the provisions of the *Administrative Code* of the City of New York in Chapter 22, Sections 564–18.0 and 564–32.0.

The elimination of all public health plumbing hazards at the New York World's Fair was carried out by the author with the aid of two assistant engineers by direction of Dr. John G. Grimley, Special Deputy Commissioner of the New York City Health Department for the Fair.

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Responsibility of Organized Medicine in Medical Care*

KENDALL EMERSON, M.D., F.A.P.H.A.

Managing Director, National Tuberculosis Association, New York, N. Y.

THE responsibility of organized medicine for medical care seventy-five years ago was approximated one hundred per cent. Since then a number of factors have appeared which leave the definition of this responsibility less clear. Such factors include the public health service, the trained nursing service, medical-social workers, organized industrial medicine, government care of the chronically ill, and a significant change in a health-minded public's attitude toward its rights in the matter of adequate medical care.

Meanwhile organized medicine has plodded along, jealously guarding some of its traditional practices, making concessions in others, usually trailing rather than leading in the changes that have occurred in the evolution of medical care. Mark carefully that this does not apply to individual physicians who have been fundamentally responsible for most of the sound progress in the above fields related to medical practice. We need only mention such names as Stephen Smith, Welsh, Delafield, Biggs, Gorgas, and the like, to convince ourselves that a full sense of the physician's responsibility for medical care of all the people has found a lively abiding place in such minds as theirs.

The psychologists long since discovered that an organization is something different from the sum of the individuals of which it is composed. There is a mob psychology which is not epitomized in any single member of the crowd. Organize a professional group and you produce an effect on its members alien to each as an individual but which becomes the common property of the group and may warp its thinking. The worst result of such organization is the tendency to stress "rights" rather than "responsibilities." This has been a notable shortcoming in many of the pronouncements of organized medicine as expressed through American Medical Association spokesmen.

There is nothing about rights in the title of this paper. Any discussion of them would lead us too far afield. I shall take it for granted that we all agree that in 1850 medical care of the people was both a *responsibility* and a *right* of the medical profession. There was nobody then to challenge this status. Today, however, laws have stepped in to define rather closely the doctor's rights; and new social forces, new medical discoveries, new and accepted government controls have appeared to assume at least part of the responsibility that once was exclusively his.

Under totalitarian rule full respon-

* Read before the Western Branch American Public Health Association at the Eleventh Annual Meeting in Denver, Colo., June 27, 1940.

sibility for medical care has been assumed by government. Organized medicine as well as the public health service is centrally directed by a council, trained or otherwise, from whose orders there is no appeal. On the other hand, in our democracy responsibility for medical care may have been allowed to go a bit too much at loose ends. This was perhaps unavoidable under a system where, until recently at least, the principle has prevailed that the less government we have the better governed we shall be.

Somewhere between these two concepts of responsibility for medical care lies a better way. Search for that way is engaging the attention of many able minds in our country. At the present time organized medicine is beginning to find it is profitable to think less of its *rights*, and more important to assume leadership in taking upon itself its *responsibilities* for medical care in the light of our modern social structure.

To do this, organized medicine is showing a tendency to go to school and study with a somewhat more liberal vision its place in the community of today. It looks with less heat and with more sympathy and understanding on the other official and social organizations lately come into the field which have the power to be medicine's staunch allies, but which at times and with some reason have proved themselves unkindly critics. In short, organized medicine is realizing that although it is an indispensable part of modern society, nevertheless social evolution has struck a pace hitherto unknown, a pace quite foreign to the dignified and deliberate traditions of medical practice. Today the doctor must be a citizen first and must understand the demands of citizenship as well as those of his profession. Organized medicine's first responsibility in medical care, then, is to insist that its members gain a clearer understanding of the changes in social structure which this century has produced.

Of the several social forces which have arisen in recent years to nudge organized medicine out of its accepted traditions of practice, effective popular health education is in some ways the most insistent of all. While organized medicine has remained largely concerned with attempts to cure the sick, the public has been taught the concept of health as not only an attainable but a maintainable commodity. The people are demanding more of their private physicians than the latter are either trained or particularly eager to dispense. Organized medicine has a very different public to handle from that which it had even a generation ago. Writers of popular books on medical subjects have descended like locusts on the land. Some of these are good; some are harmful. The busy doctor has no time to read them. His patients have, and are often critical and even suspicious if he is not as familiar with them as he is with the writings of Osler.

A second responsibility of organized medicine in medical care has to do with its own economics. The practising physician, both in general and in specialized practice, is a highly essential factor in human welfare. He must survive and serve, no matter how far preventive medicine may be perfected in the future. Accidents will happen, babies will be born, men will die, as they always have. On the other hand, the costs to the practitioner of maintaining himself, his family, and his work are increasing yearly, almost daily. The amount of preparation required grows; expensive mechanical equipment becomes indispensable in both diagnosis and treatment. With the improvement in preventive measures and the conquest of one epidemic disease after another, the actual care of the sick is relatively reduced. The discovery of new diseases to treat does not keep

pace with this reduction. Certain areas are definitely over-supplied with practitioners; other regions are undermanned. Survival is becoming a matter of distribution.

In facing this difficulty physicians themselves have tried many experiments along the general line of group practice. At these reasonable efforts, organized medicine has shown a tendency to look askance. The most outstanding instance is the recent experience in Washington, D. C., where organized medicine came very near falling into the toils of the Sherman Anti-trust Law. It escaped, but the principle seems to have been established that the local medical society, a fraction of the A.M.A. cannot prohibit other societies from practice when they are "organized legally and with rules relating to membership or behavior of members that are not found to be illegal." This principle holds even though such societies do not meet the approval of the local medical society.*

While its members are being driven for economic reasons to accept salaried positions, often in state pay, organized medicine still clings to its age-old belief in what it refers to as the freedom of the medical practitioner.

Three questions arise: Is this freedom as actual as it appears? Is it worth the uncertainties and financial difficulties faced by organized medicine? Is it worth the constant and irritating charge, supported by far too sound argument for complete refutation, that the people of this country are receiving inadequate medical care under the existing system?

The answer to the first is that, of course, the freedom of the medical practitioner is not what he thinks. In the first place he is already hemmed in by laws and restrictions limiting his practice in many ways. Second, he must rely on publicly supported hospitals, outside his control, for the care of many of his patients. Third, he is sadly limited in what he can now do by way of treatment because of the restricted financial condition of his patients themselves. The scientific practice of medicine is one thing; the possibility of its actual application quite another.

The answers to the other two questions, that of the doctor's living, and the inadequacy of medical care, I believe need not detain us. Dr. Hugh Cabot's book *The Doctor's Bill*, discusses the former, and even the somewhat sketchy "research" of the A.M.A. shows room for improvement in the country's medical care as it actually exists.

In attempting thus to outline the swiftly changing conditions that surround organized medicine and medical practice today, I have been somewhat unjust to the medical profession and to organized medicine itself. We must never forget that the very conditions that have altered and complicated the physician's problems are largely the product of his own unselfish and expert work in the fields of medical research and the application of new scientific discoveries. Already, for example, he has entered deep into the field of preventive medicine in a number of the specialties.

Within the ranks of organized medicine certain prophets arose back in the 'eighties and 'nineties with a vision decades ahead of their time. I refer to such men as Emmett Holt, Thomas Roach, and John Morse, in the field of pediatrics, who decided that it was wiser to feed babies properly from the start than to be called upon *in extremis* to watch them die in the convulsions of toxic enteritis. The pediatricians soon learned, and have pointed the way to the medical profession ever since, that the supervision of the healthy was the

* *New England J. Med.*, May 30, 1940, p. 940.

soundest form of productive medical practice.

In May, in Washington, before the Pan-American Scientific Congress, I heard Dr. Paul D. White, of Boston, read a paper on modern concepts of heart disease. Up to a generation ago our efforts went chiefly toward treatment of the recognized heart condition, very little to any study of the causes of the disease, practically none toward efforts to prevent these causes. The reversal of this traditional attitude during the past fifty years has transformed the cardiologist from the plodding slave of digitalis to a leader in the field of preventive medicine.

In my early days of practice, we orthopedic surgeons gloried in the osteoclast after bones had been allowed to become deformed. Now we are internists preventing deformity with cod liver oil and sunshine, and applying only an occasional brace.

These are but random samples of organized medicine's rapidly changing point of view. With its sera and vaccines and various immunological resources, it has entered the field of preventive medicine and public health. I cite these instances to indicate that we are not reactionary traditionalists at heart, only a bit slow on the pick-up. I cite them further to give point to the following opinion which I believe has weight at the present moment.

The time is over-ripe to discard our outworn terminology, to stop talking about curative and preventive medicine, to use instead the designation "medical care," whether that care is furnished to the absolutely healthy, the mildly indisposed, the acutely ill, or the chronic invalid. The term "public health" should be broadened to mean no longer a specialty in medicine, but to be taken in its literal sense as describing the health status of a community at any given moment and its averages through the years.

As already stated, the pediatricians learned this long ago. I wonder how many of them could continue in practice if they saw none but sick babies. The cardiologist derives the satisfactions of practice from learning ways to keep normal hearts normal. Endocrinologists are engaged in promoting health through refinement in the delicate adjustment of glandular activities which represent imbalance rather than disease. Psychiatric interest centers in mental health. Phthisiologists take thousands of pictures of normal chests rather than await the onset of pulmonary hemorrhage.

Organized medicine complains that the public health service is invading its sacred field of treatment and complains vaguely of "state medicine." It forgets that already it has itself invaded far deeper the field of preventive medicine and that its onslaught has but just begun. Organized medicine will do well to realize that of the diseases which still occur many are preventable and sometimes due to medicine's own ineptitude. Organized medicine should fix its eyes more fervently on the vision of its great idealists: first, the promotion of health; and second, treatment of disease. This is its great responsibility in medical care and it can be achieved best by obliterating the divisive names, preventive and curative, and bestowing the single title, medical care, to both.

What is organized medicine's first step toward this objective? The most effective place to begin is in the undergraduate medical school. A start has already been made, a striking one in New York, for example, where a district medical center has been provided by the public health service adjoining each of the five medical schools, in which thorough training of the undergraduate may be carried out in preventive medical theory and practice. Some other famous schools have already

taken this step. All will follow shortly.

The most effective work will be with the young physicians still in schools. Much, however, can be accomplished by extending to older practitioners the growing resources and opportunities for training in preventive medicine.

A second step is the more generous recognition of the merits, from the patient's point of view, of group practice in its various phases. For the most part, modest salaries in group practice are the rule. But the satisfactions of practice are not all financial. The rendering of service to their fellow men is the first principle of the physician's code. Group practice offers this reward in abundance.

In the abuse of free treatment clinics by patients having the capacity to pay, the doctors have an obvious grievance. On the other hand, in the case for example, where a public health treatment clinic is definitely for the protection of the public at large, as in the case of venereal disease, the physician must remember once again that he is a citizen first, and resolve this controversy in a spirit of equity and fair play for the public weal.

Already organized medicine has approved the insurance principle in the matter of hospitalization of the poor and moderately well-to-do. The time has come when this is in fact no longer controversial if the hospitals are to survive.

Voluntary health insurance has appeared upon the social scene in protean forms. This is a tide which organized medicine could not stem even though it so desired. The misfortune is that sound insurance principles are not more closely observed and that so many attempts are doubtless destined to fail before at last a satisfactory plan develops.

Toward compulsory health insurance organized medicine's attitude remains implacable. I will own to a rather strong doubt in my own mind as to the wisdom of suggestions thus far offered. It seems to me that there is an inherent evil in any compulsory scheme that includes only certain classes of those economically entitled to the service. It seems to me that a federal plan of compulsion in a country of so divergent characteristics as our own is beyond human power to administer. Regional or state-wide schemes on a trial basis would appear to be more logical. This is only one man's opinion and I still believe that experiment should continue, and only hesitate at going off the deep end instead of approaching the problem through shallower water.

Organized medicine's responsibility in medical care would be easier to define if all federal bureaus dealing with the nation's health were brought under a single department, such as a Ministry of Health. The A.M.A. would achieve a clearer definition of its advisory position in the fields of research, demonstration, and medical economics. Broadly speaking, it could occupy a relationship toward a federal department of health which the American Public Health Association occupies toward the U. S. Public Health Service. The tranquility which reigns in the latter relationship should be easy to develop in the former. Government endorsement of advice based on A.M.A. research would add to its weight and value.

In conclusion, organized medicine has travelled a long road toward assuming its responsibilities for medical care since it yielded, a bit unbecomingly, to its first irritation at the sensational revelations of the study entitled "The Costs of Medical Care." Much of the sound and fury has subsided. Organized medicine has emerged from the controversy not so badly off. Little by little the early attitudes of the House of Delegates have softened until now the platforms of the two schools of thought find daily less to keep them apart.

The health of the people is the first duty of government. The skill through which alone that health may be assured is in the hands of the trained members of organized medicine. Any act on the part of government which limits or thwarts that skill is not in the service of the people. Recognition of a common aim must be the guiding principle for a complete reconciliation between the two agencies. A first step in such reconciliation will be taken when both realize that medical care includes both curative and preventive medicine and that the two, if not identical, are at least homologous twins.

Typing of Typhoid Bacilli in the Western States by Means of Bacteriophage*

ALFRED S. LAZARUS, PH.D.

Instructor, Department of Bacteriology and Public Health, University of Colorado School of Medicine and Hospitals, Denver, Colo.

THE method of typing various strains of *Eberthella typhosa,* as suggested by Craigie and Yen in 1938,[1] has to date received neither the recognition nor the widespread application that its useful possibilities seem to justify. The survey reported here was undertaken in an effort to bring the advantages of this method to the attention of those most likely to benefit by its use.

The typing method is based on certain peculiarities of a strain of bacteriophage, which is not only specific for the Vi form of the typhoid bacillus but also exhibits a selective affinity for the particular strain of *Eberthella typhosa* on which it is propagated and for epidemiologically related strains. This bacteriophage, which is termed Type II Vi phage, shows no action on the W form of *Eberthella typhosa,* nor does it affect any of the other pathological or normal inhabitants of the intestinal tract of man. By selective propagation of this bacteriophage on various strains of *Eberthella typhosa,* Craigie and Yen [1] have shown that it is possible to divide freshly isolated cultures into a limited number of readily distinguished types, which have been designated by the letter system A to J inclusive with the exception of I. Later reports by Craigie [2, 3] and by Yen [4] have subdivided types B, D, E, and F, and additional studies have reported new types designated as types L and M,[5] which are, however, rarely encountered.

METHOD

The method for typing cultures of *Eberthella typhosa* has been described in detail by Craigie and Yen,[1] and space does not permit a full description of the procedure. In brief, the method consists in applying a standard volume of a young broth culture of *Eberthella typhosa* to given areas of a nutrient agar plate and allowing the broth to dry. In the center of each of these areas is then deposited a standard volume of the typing phages. The plate is allowed to dry and is then inverted and incubated at 37.5° C. for approximately 2 hours. After storage overnight at a temperature of 4° C., the plates are again incubated at 37.5° C. for 3 to 5 hours and the results are then read. Type A cultures are lysed by all the phage preparations, while all other types show confluent lysis only with the homologous phages. Occasionally nonspecific plaques are pro-

* Read before the Western Branch, American Public Health Association at its Eleventh Annual Meeting in Denver, Colo., June 26, 1940.

TABLE 1

Distribution of Cultures by States

	Type												
	A	B_1	B_2	*C*	D_1	E_1	F_1	*J*	*L*	*M*	*Imp. V*	*W*	*Totals*
California	15	1	4	7	—	22	40	2	1	1	13	2	105
Colorado	—	3	1	2	—	4	1	—	—	—	1	—	12
Idaho	—	—	—	1	—	—	1	—	—	—	—	—	2
Montana	—	1	4	—	—	2	—	—	—	—	—	4	11
Nevada	—	—	—	1	—	—	—	—	—	—	—	—	1
New Mexico	5	6	24	2	7	32	16	—	—	—	12	1	105
Oregon	24	1	4	7	5	14	10	4	—	—	6	1	76
Utah	1	—	2	10	1	—	—	—	—	—	—	2	16
Washington	7	1	1	—	2	7	—	1	—	—	—	9	28
Totals	52	13	40	30	15	81	68	7	1	1	32	19	359

duced, but there is little possibility of confusing these with the confluent lysis produced by the specific phages in the test dilutions. The technic of the tests, as described in the original publication [1] has been followed in all its essential details in the survey herein reported.

It must be emphasized that cultures can be typed only when in the Vi form, which means that the percentage of successful typings depends on the handling of the cultures prior to submission for typing. Freshly isolated cultures which have not undergone prolonged incubation or numerous transfers should yield a very high percentage of successful typings.

In addition to the Vi and W forms, Craigie and Yen have described the so-called imperfect V form, which is a typical Vi form in every respect except sensitivity to the type II phage preparations. These forms cannot be typed at present, but newer procedures may make it possible to classify these strains in the near future.[5]

RESULTS

This preliminary study, with material obtained through the courtesy of the many coöperating laboratories, has not only demonstrated many of the uses of the typing method, but has also given some indication of the distribution of the various types throughout the West. Table 1 shows the distribution of 359 cultures studied in the period from November 1, 1939, to June 1, 1940. It will be noted that types B_3, B_4, D_2, D_3, E_2, F_2, G, and H have not as yet been encountered in the area being studied. The figures in Table 1 also demonstrate that 97.1 per cent of all the typed cul-

TABLE 2

Distribution of Individuals by States

	Type													
	A	B_1	B_2	*C*	D_1	E_1	F_1	*J*	*L*	*M*	*Imp. V*	*W*	*Total*	*Per cent Typed*
California	12	1	4	6	—	16	37	2	1	1	7	2	89	90
Colorado	—	3	1	1	—	4	1	—	—	—	1	—	11	91
Idaho	—	—	—	1	—	—	1	—	—	—	—	—	2	100
Montana	—	1	3	—	—	1	—	—	—	—	—	2	7	71
Nevada	—	—	—	1	—	—	—	—	—	—	—	—	1	100
New Mexico	5	5	17	2	5	23	11	—	—	—	3	1	72	94
Oregon	16	1	3	6	3	9	8	3	—	—	5	1	55	89
Utah	1	—	1	10	1	—	—	—	—	—	—	2	15	87
Washington	7	1	1	—	2	7	—	1	—	—	—	9	28	68
Totals	41	12	30	27	11	60	58	6	1	1	16	17	280	88.2

TABLE 3

Number of Isolations per Individual

Number of Times Isolated Per Individual	Type												
	A	B_1	B_2	*C*	D_1	E_1	F_1	*J*	*L*	*M*	*Imp. V*	*W*	*Totals*
1	34	11	23	24	8	48	51	5	1	1	11	15	232
2	6	1	6	3	2	6	4	1	—	—	1	2	32
3	—	—	—	—	1	4	3	—	—	—	3	—	11
4	—	—	—	—	—	1	—	—	—	—	—	—	1
5	—	—	1	—	—	1	—	—	—	—	—	—	2
6	1	—	—	—	—	—	—	—	—	—	—	—	1
10	—	—	—	—	—	—	—	—	—	—	1	—	1
Number of Individuals	41	12	30	27	11	60	58	6	1	1	16	17	280
Number of Cultures	52	13	40	30	15	81	68	7	1	1	32	19	359

tures fall into the 6 main groups A, B, C, D, E, and F.

Since in many cases more than one culture was received from the same individual, Table 2 is included to show the distribution of the individual patients by states. It will be noted that 88.2 per cent of all those patients studied have been successfully typed, while the remainder of those investigated were represented by W or imperfect V form cultures. The percentage of successful typings should increase as the need for submitting freshly isolated cultures becomes more generally recognized. The cultures submitted for typing in the present study ranged up to 12 years in age and it is felt that, under these conditions, a successful report in 88.2 per cent of all individuals is decidedly encouraging.

Table 3 shows the number of isolations per individual for the 280 patients studied in this survey. It is to be emphasized that no exceptions to the type stability as originally reported by Craigie and Yen[1] have been encountered. This stability of type in the individual has been further confirmed in laboratory studies now in progress, using white mice. The only known example of change in type is the single case reported by Helmer and her collaborators,[6] but it must be noted that this change was one in subtype only. Since the significance of the subtypes is not yet certain, this single case does not destroy the usefulness of the typing method.

Table 4 shows the origin of the 359 cultures studied in this preliminary survey. Table 5 represents in condensed form the results of this investigation.

TABLE 4

Origin of Cultures and Status of Individuals

	Sources	*Number of Cultures*	*Total*
Cases	Blood	84	261
	Urine	9	
	Feces	143	
	Unknown	25	
Carriers	Feces	37	43
	Unknown	6	
Unknown	Feces	31	48
	Urine	1	
	Unknown	16	
Pericardium at Autopsy			1
Gall Bladder after Removal			1
Chest Abscess			1
Rib Abscess			1
Abdominal Wound			1
River Water			1
Septic Tank Effluent			1
Total Cultures Studied			359

TABLE 5

Summary

Total Number of Cultures received	359
Number of Cultures typed	308
Total Number of Individuals represented	280
Number of Individuals represented by typed cultures	247 or 88.2%

DISCUSSION

Numerous possibilities regarding the application of the typhoid typing method are readily seen. Some of the

major facts regarding the uses of method are as follows:

1. All cases arising from a carrier will show the same type as the carrier and therefore the same type as each other.
2. The typing of all known carriers in a given area will permit the immediate elimination of some carriers from consideration and the investigation of the activities of others when typhoid cases occur in the same district.
3. In any outbreak, the typing will show the minimum number of sources involved. The typing will often allow the detection of two or more concurrent outbreaks and will also permit the separation of endemic and epidemic cases.
4. Typing of all cultures from a given outbreak will usually determine whether the epidemic is due to a carrier or to sewage contamination. If all cases show the same type, a carrier is probably responsible; if a variety of types is encountered, sewage contamination is probably responsible for the outbreak.[7]
5. Complete typing studies in a given outbreak will indicate definitely whether all sources of infection have been uncovered.

Additional applications and possibilities will undoubtedly occur to the minds of those interested in this method.

A brief discussion of some actual uses of the typhoid typing method may be of interest.

Example 1—An outbreak of typhoid fever in Los Angeles City and County in the fall of 1939 was investigated by typing and epidemiological studies. The typing results showed a great preponderance of a single type, accompanied by scattered cases of non-related types. On the basis of the laboratory investigations, which were carried out in Denver without any epidemiological information, it was possible to predict that the outbreak was due to a carrier discharging type F_1 organisms and it was also possible to separate most of the sporadic endemic cases from the main outbreak. Epidemiological studies were in almost complete agreement with laboratory reports. When the carrier was located he was discharging the same type organisms as had been predicted. To the best of our knowledge, this was the first concurrent application of epidemiological and typing studies in a typhoid fever outbreak in the United States. The outbreak is reported in detail elsewhere.[8]

Example 2—Type J cultures were received within a short time from the southern part of Washington and the northern part of Oregon. Due to the rarity with which this type was encountered and the almost simultaneous arrival of the cultures, the matter was investigated more closely. It was found that the Washington culture was from a carrier and the Oregon culture was from a clinical case, the grandson of the carrier, who had visited his grandfather within a possible incubation period before symptoms appeared. This example points out the value of a centralized typing laboratory in correlating reports between states.

Example 3—A carrier in New Mexico had no known contacts with clinical cases in her vicinity. However, most of the typhoid cases in the vicinity showed the same type of organism as the carrier. Such evidence, while not conclusive, indicates the possibility of infection chains as yet undisclosed.

Example 4—A septic tank in Utah showed typhoid bacilli in the effluent. A follow-up showed several carriers of the same type of *Eberthella typhosa* in the family using the tank. An affidavit as to the typing results was of legal aid.

Example 5—A known carrier in Washington State sold cream to a creamery, where it was pasteurized and made into butter. No cases have been reported among users of the butter. A family using separated milk sold directly by the carrier showed a case of typhoid. Another case appeared in a family who ate a meal with the family of the carrier. Both these clinical cases showed the same typing results as the carrier.

Example 6—A Washington carrier,

with a history of typhoid fever 40 years previously, sold milk to a confectionery. Clinical cases which developed in two purchasers of the milk showed the same type organism as the carrier.

Example 7—A practical nurse in Colorado cared for a suspected typhoid carrier. The nurse and two members of her family subsequently developed typhoid fever. All the cases showed the same type organism.

Example 8—A Montana culture obtained from a clinical case in a small town was followed 1 week later by a culture from the brother of the first patient. The two patients showed different types, and with our present knowledge of the typing method, it was possible to report that one carrier could not have infected both patients, nor could the second patient have been infected by his sister. The chances of two different carriers infecting two members of the same family at approximately the same time seemed rather remote, and it was therefore suggested that the water supply be investigated, since a heavily polluted water could give rise to different types in different users of the water. Investigation showed a history of having drunk raw creek water in the town.

The above examples not only furnish additional evidence regarding the stability of types but also point out some of the ways in which the typing method may aid in establishing the source of infection in a given case, which is a matter of primary importance to the health officer, epidemiologist, and the sanitarian. At the present time, it is not practical for the laboratories concerned to do their own typing, largely because of the lack of trained personnel. However, the method is easily learned and it is hoped that it will eventually be applied as routine procedure. Another alternative is the establishment and support of a centralized bureau for the typing and control of all known carriers, with financial aid supplied by the states interested or by the federal government. At present, the author will type and report promptly on all typhoid strains submitted. Data indicating the source of the culture and the status of the patient would be helpful in future summaries of results.

SUMMARY

The typhoid typing method of Craigie and Yen is proving a valuable and sensitive tool in the control of typhoid fever. Properly applied, the method can be a useful adjunct to epidemiological studies.

In a study of 359 cultures obtained in 9 western states, the typing method has yielded valuable information in numerous cases. The procedure, when applied routinely, is expected to do much to reduce the incidence of a once serious disease.

Pending the establishment of a permanent agency for the control of carriers, the author is prepared to assist in the laboratory study of freshly isolated strains and will report as promptly as possible on the results of the typing procedure. The future progress of this work is obviously dependent on the aid and coöperation of all concerned.

ACKNOWLEDGMENT—The author wishes to express his thanks to Dr. James Craigie of the University of Toronto for the original supply of type cultures and homologous bacteriophage preparations and for numerous helpful suggestions. Gratitude must be expressed to Dr. Karl F. Meyer of the University of California and to Dr. Fred T. Foard of the U. S. Public Health Service for their invaluable aid in establishing sources of material. The directors and technicians of the state, county, and city laboratories which supplied material for this survey are responsible for having made this work possible and their aid is gratefully acknowledged.

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Rapid Methods for the Estimation of Air Dustiness*

HELMUTH H. SCHRENK, PH.D.

Chief Chemist, Health Division, Bureau of Mines, Pittsburgh, Pa.

THE classification of dust methods as rapid or not rapid is difficult, and depends on the interpretation of the word "rapid." Several methods for estimating air dustiness could qualify as rapid, but they are limited in scope and are not applicable for certain purposes; therefore, other methods in common use that are required for certain applications are included in the discussion.

Owing to the large amount of material that has been published on the various technics for the estimation of dust concentrations, no attempt will be made to describe in detail the "cook book" part of the procedures, but rather the more general aspects will be considered.

PROPERTIES AND CHARACTERISTICS OF AEROSOLS

Dust suspended in air is a colloidal system in which air is the dispersion medium and dust (suspensoid or dispersoid) the dispersed phase. Such a system is called an "aerosol" which is analogous to the term "hydrosol" used to designate dispersed systems in water. As the dispersion medium (air) remains fairly constant in composition, consideration will be given primarily to the dispersoid, that is, dust.

Dust is formed by disintegration of solid material by such processes as grinding, crushing, drilling, and shattering. The qualitative composition of the air-borne dust formed from complex substances is largely the same as that of the parent substance, but soon after being released into the air the quantitative composition may differ owing to differential disintegration and selective settling. An aerosol, therefore, may be made up of particles varying widely in size and composition. The particles may not be distributed uniformly in the air and are in a changing state owing to settling, flocculation, and air currents. The chemical, physical, electrical, and optical properties of the particles add to the complexity.

These considerations indicate the extreme difficulty of developing a method that will give absolute values for the number of particles in the air. The methods available give only an empirical value or index of air dustiness. Because of the empirical nature of the methods it is not to be expected that the results obtained by different methods will agree closely unless the technic is essentially the same.

PURPOSE OF MAKING ESTIMATIONS OF AIR DUSTINESS

Estimations of air dustiness are made for various reasons, such as determina-

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TABLE 1

Methods of Estimating Air Dustiness

Method	Collection	Estimation: Direct	Estimation: Indirect	Reference
		Dust Not Collected from Air		
Tyndallometer	—		Photometry	Berek, M., Männchen, K., and Schäfer, W., Über tyndallometrische Messung des [illegible] und ein [illegible] *Ztschr. f. Instrumentenkunde*, 56: 49–56, 1936.
Dustoscope	—		Comparison	Service to Industry, Box 133, West Hartford, Conn., Dustoscope.
Dust camera	—	Counting	do.	Ficklen, J. B., and Ott, L. H., A Photographic Dust Counter for Industrial Health Purposes. *J. Indust. Hyg.*, 17:164–173, 1935.
		Dust Collected from Air		
Rapid samplers				
Konimeter	Impingement on coated slide	Counting		Littlefield, J. B., Brown, C. E., and Schrenk, H. H., Technique for Routine Use of the Konimeter. Bureau of Mines, *Information Circular 6993*, 1938, 6 pp.
			Photometry	Walton, W. H., The Estimation of Konimeter Dust Spots. *J. Indust. Hyg. & Toxicol.*, 18:689–698, 1936.
Hill	do.	do.		The Surty Manufacturing Co., Inc., 4139 W. Kinzie St., Chicago, Ill., Dust Danger and Dust Counts: *Catalog No. 12.*
Owens Jet	Condensation and impingement	Counting		Owens, J. S., Jet Dust Counting Apparatus. *J. Indust. Hyg.*, 4:522–534, 1923.
Owens-Hatch	do.		Comparison	Hatch, T., and Thompson, E. W., A Rapid Method of Dust Sampling and Approximate Quantitation for Routine Plant Operation. *J. Indust. Hyg.*, 16:92–99, 1934.
Bausch & Lomb	do.	Counting		Gurney, S. W., Williams, C. R., and Meigs, R. R., Investigation of the Characteristics of the Bausch & Lomb Dust Counter. *J. Indust. Hyg. & Toxicol.*, 20:24–35, 1938.

tion of source of dust, study of air pollution, and effectiveness of dust control measures, estimation of the health hazard, and establishment of permissible limits. The choice of a method may, and in many instances does, depend on the purpose for which the estimations are being made. If results are desired for control or for determining the source of dusts, almost any method can be used. If, however, one wishes results that will be comparable with those obtained previously, then the same method must be used, because results obtained by different methods are not necessarily comparable. In estimating the health hazard on the basis of permissible concentrations, it is particularly important to use the method by which the permissible concentrations were established. This is the main reason for the general use of the impinger in this country, regardless of its advantages and disadvantages.

ESTIMATION OF AIR DUSTINESS

Table 1 lists rapid and other well known methods for the estimation of air

TABLE 1 (Cont.)

Methods of Estimating Air Dustiness

Method	Collection	Estimation: Direct	Estimation: Indirect	Reference
		Dust Collected from Air		
Slow samplers				
Impinger	Impingement and washing	Counting		Brown, C. E., and Schrenk, H. H., A Technique for Use of the Impinger Method. Bureau of Mines, *Information Circular 7026*, 1938, 20. pp.
			Photometry	Photometric Dust Determinations. *Iron Age*, 144:46 (July 6), 1939.
Electric precipitator	Electric precipitation	Weighing; Counting; Chemical analysis	Photometry	Barnes, E. C., and Penney, G. W., An Electrostatic Dust Weight Sampler. *J. Indust. Hyg. & Toxicol.*, 20:259–265 (Mar.), 1938.
Thermal precipitator	Thermal precipitation	Counting		Patterson, H. S., Sampling of Mine Dusts with the Thermal Precipitator. *Inst. Min. and Met. Bull. 417*, June, 1939, 7 pp., 1 pl.
Soluble filters	Filtration	Counting; Weighing; Chemical analysis		Matthews, J. W., Holt, P. F., Sanderson, P. M., and Briscoe, H. V. A., Porous Solid Filters for Sampling Industrial Dusts. *J. Chem. Met. & Min. Soc.*, South Africa, 37:161–166 (Nov.), 1936.
Thimble	do.	Weighing; Chemical analysis		Trostel, L. J., and Frevert, H. W., Collection and Examination of Explosive Dusts in Air. *J. Indust. Eng. Chem.*, 15:232–236 (Mar.), 1923.
Filter paper	do.	Weighing		Katz, S. H., and Smith, G. W., Determination of Suspended Matter in Gases by Collection on Filter Paper: Bureau of Mines, *Rep. Investigations 2378*, 1922, 6 pp.
			Comparison	Shaw, N., and Owens, J. S., *The Smoke Problem of Great Cities.* Constable & Co., Ltd., 10 and 12 Orange St., Leicester Square WC 2, London, 1925, 301 pp., ch. VII.

dustiness, but no attempt has been made to include all procedures. The methods have been divided into two groups: (1) Those in which estimations are made without collecting the dust from the air, and (2) those in which the dust is collected from the air before it is estimated. The collection methods are subdivided into two groups on the basis of sampling rate, that is, there are rapid samplers and slow samplers. Methods of estimating the dust are divided into direct and indirect procedures.

METHODS IN WHICH DUST IS NOT COLLECTED

Probably the simplest method of estimating dust concentrations is direct observation. This method, of course, is limited, mainly because of inability of the human eye to see concentrations of dust that are of hygienic significance unless the particles are magnified.

Methods based on the Tyndall effect and those in which readings can be obtained on the concentration of dust as it exists in the air have interesting possibilities. No changes are produced in the dust such as may occur when dust is collected. It is easy to demonstrate the presence of dust in the air. Readings can be made rapidly and continuously, thereby showing variations in concentrations. On the other hand,

there are both theoretical and practical reasons why these instruments have not been widely used. If the amount of reflected light is measured, variations are caused by size and color of particles; fogs and mist affect results, and it is difficult to measure low concentrations. If the amount of dust is estimated by direct visual observations of reflected light the results obtained can be only approximate. If the particles are photographed, the apparatus, accessories, and technic tend to be complicated.

METHODS IN WHICH DUST IS COLLECTED

As already stated, methods for the estimation of air dustiness that require collection of the dust from the air for quantitative determination are divided into two groups on the basis of sampling time.

The rapid samplers are usually small and compact; little time is required for sampling; numerous samples may be taken; and the samples may be quantitated without special preparation. They are particularly useful for preliminary surveys, for control operations, and for following a cycle of operations when conditions are changing rapidly. Dust is collected from only a small volume of air and several samples are required for a fair average.

The slow samplers collect the dust over a period of time and give samples that are more representative of average conditions. The amount of dust collected is greater and offers better opportunities for several methods of quantitation and for making other examinations such as determination of composition. The devices usually are bulky, and power requirements may be large.

COLLECTION OF SAMPLE

In choosing a method for collecting dust samples it is necessary to consider the complexity of the aerosol, efficiency of collection, effect of collection on dust, and determination of quantity. For example, oil droplets interfere in counting samples collected by impingement on slides. Whether or not a method has poor, good, or excellent collecting efficiency should be known, as well as any special characteristics such as selective efficiency. The effect of collection on the dust, as solubility and shattering should not be overlooked. The method of collection is important from the standpoint of quantitation because the dust may be so affected that some methods of quantitation may be impractical or impossible. If count only is desired a very small sample may be sufficient; if weight and composition are desired, larger samples must be collected. Cryolite has a refractive index almost the same as that of water; therefore it would be difficult to count the dust particles if this liquid were used for collection. Dust that is soluble in impinger liquids cannot be collected by this method for counting. In other words, the choice of collecting procedure may depend not only on the properties of dispersoids in the air but also on subsequent treatment of the sample.

Table 1 lists the following methods for collecting dust: Impingement on a coated slide, condensation and impingement on a clean slide, impingement and washing, electric precipitation, thermal precipitation, and filtration.

Impingement on coated slide—Devices that collect dust by impingement on a coated slide apparently have a fairly high collecting efficiency. Mist, oil droplets, and smoke may make counting difficult. Particles tend to "pile up," and the upper limit of dust concentrations that can be estimated may be as low as approximately 50 million particles per cu. ft. Difficulty has been found in obtaining a suitable adhesive and in applying a film to the slide.

Condensation of moisture and impingement—Devices that collect dust by condensation of moisture and im-

pingement apparently have a fairly high collecting efficiency, although they are somewhat selective for particles of different sizes. Mist, oil droplets, and smoke may make counting difficult or give unusually high counts if dark-field illumination is used.

Impingement and washing—Collection by impingement and washing, the principle on which the well known impinger apparatus is based, is a highly efficient method, especially for dusts that have hygienic significance. The sample collected may be counted, weighed, and determined chemically or photometrically.

In collecting a sample by the impinger for counting, consideration must be given to such factors as refractive index (cryolite), solubility (potassium chloride), specific gravity (wood dust will float), and flocculation (asbestos in water). Shattering of dust particles by the impinger has been reported recently in several articles. Owing to its interest data collected on this subject during other studies are presented.

by the dark-field technic were slightly lower for the impinger, indicating the possibility that the impinger did not stop some of the smaller particles that were stopped by the electric precipitator. Unless one assumes that shattering is caused to the same extent by the electric precipitator, or that by some fortuitous circumstances the increase in count caused by shattering just balanced a lack of efficiency on the part of the impinger, apparently there is no significant shattering of silica dust. Other dusts may behave differently. These results are presented for their general interest, and it is not to be inferred that they completely answer the question of shattering by the impinger. They also indicate that the electric precipitator may be used for the collection of silica-dust samples to be quantitated by the impinger counting technic. Before this procedure is used for other dusts comparative estimations should be made with both the impinger and electric precipitator.

Electric precipitation—Electric precipitation probably is the most efficient method for the collection of dusts. Samples may be collected on metal or glass tubes or on metal or plastic foil.

Thermal precipitation—Thermal precipitation, which is based on the

TABLE 2

Concentration of Silica Dust (SiO_2), Millions of Particles per Cubic Foot, in Electric Precipitator and Impinger Samples

Light Field		*Ratio, Impinger to Electric Precipitator*	*Dark Field*		*Ratio, Impinger to Electric Precipitator*
Electric Precipitator	*Impinger*		*Electric Precipitator*	*Impinger*	
51	45	0.88	442	375	0.85
55	40	0.73	420	375	0.89
55	40	0.73	442	468	1.06
257	287	1.12	1,990	1,090	0.55
283	375	1.32	1,550	2,030	1.32
290	280	0.97	1,960	1,610	0.82
354	450	1.27	1,880	1,250	0.67
381	388	1.02	2,430	1,870	0.77
381	438	1.15	2,100	2,190	1.04
398	475	1.19	2,320	2,660	1.15
407	387	0.95	2,880	2,180	0.76
		1 03 *			0.90 *

* Average

Table 2 gives the results of counts by light- and dark-field technics of samples collected simultaneously by the large impinger and by an electric precipitator. Counts by the light-field technic were in good agreement. Counts

phenomena that dispersoids are repelled from a warm area and deposited on a cool surface, recently has been used widely in England. It is a highly efficient method. The sampling rate is very slow—a few milliliters per minute. The samples are collected on glass cover slips.

Filtration — Filtration methods collect the dust in or on filter media such as paper thimbles, filter paper, and soluble filters that have high collecting efficiency. Samples collected with paper thimbles or filter paper can be determined quantitatively by weighing or by comparison on basis of color. Change in resistance also has been used as a criterion of the amount of dust collected. Dust collected with soluble filters may be counted, weighed, and determined chemically or photometrically. This method ordinarily is used in collecting fairly large samples to determine the composition of the dust.

ESTIMATION

As stated previously, methods of estimation have been divided into direct (weighing, chemical analysis, and counting) and indirect (in which readings are compared photometrically or with a standard, such as the automatic Owens method).

DIRECT METHODS

Weighing—Weighing is one of the simplest ways of estimating collected dust. The main objection to this method for pneumoconiosis producing dusts, where surface area of the particles is a prime consideration, is the fact that the results are unduly affected by a few large particles. Another objection is the difficulty of obtaining exact weight owing to the small size of the sample and complications of weighing procedure by condensation of moisture on the collection medium.

Chemical analysis—Chemical analysis is used widely for determination of all except pneumoconiosis producing dust, for which chemical methods are involved and not very satisfactory.

Counting—Counting is the most commonly used method of estimating pneumoconiosis producing dusts for hygienic purposes. It is generally agreed that only particles smaller than 10 microns are physiologically significant, and that most of the particles of air-borne dust usually are less than 3 μ. As the smallest particles that can be seen with the naked eye are approximately 100 μ, the microscope is necessary for counting the particles. Obviously the size of the smallest particles seen will vary with the optical system used. The size of the smallest visible particle depends on the objective and is not influenced significantly by the eyepiece or tube length. Standardization of technic is necessary to obtain good reproducibility.

INDIRECT METHODS

Photometric measurements — Differences in particle size and color cause variations in measurements of reflected and transmitted light; hence such measurements are limited primarily to dusts that are fairly uniform. Calibrations are necessary for each type of dust.

Comparison with standards — Comparison with standards affords a rapid means of making estimations. Although this method gives only approximations and its application has been limited, it offers interesting possibilities.

DISCUSSION

The choice of a method depends not so much on whether it is rapid or slow as on the circumstances relating to the estimations. In fact, virtually every survey introduces new factors that must be solved individually and that require common sense and ingenuity on the part of the operator.

The empirical nature of the results

might be taken as an encouragement for carelessness in carrying out estimations. Just the opposite should be true. Some changes in technic may have little or no significant effect, whereas other seemingly minor ones may affect the results materially. Established technics should be followed carefully, and innovations should not be introduced without careful study.

Considerable thought and care should be used in interpreting dust estimations. A thorough understanding of the industrial operations and limitations of the method is essential to an intelligent interpretation of the results. It is easy to consider the results as absolute and to read into them something that is not there. This point can be emphasized by citing an example of the reported shattering of dust by the impinger. On seeing one report an executive was extremely angry at the situation. His interpretation was that the impinger was making more particles than were present in the air, thus exaggerating conditions in his plant, and that he was being forced to do more dust control work than was necessary. He overlooked entirely the fact that the impinger had been used in establishing the permissible limits, therefore, that any shattering would have occurred also when the permissible limits were established. In other words, whether or not the impinger causes shattering has no significant effect on the practical value of the impinger.

SUMMARY

Various methods are given for the estimation of air dustiness. Principles and technic of collection and quantitative determination are discussed briefly. Interpretation of dust estimation should be based on an understanding of atmospheric conditions, work schedule, plant operation, physiological effects of dusts, and limitations of the method used.

DISCUSSION

EDWARD C. J. URBAN

Engineer, Office of Industrial Hygiene, State Department of Public Health, Barre, Vt.

DR. SCHRENK, in his paper, discussed the properties of "aerosols," why estimations of air dustiness are required, and the various methods by which these estimations can be made

It was shown that a dust condition exists because an industrial process in operation is associated with the generation of quantities of dust. The dust concentrations present in the surrounding atmosphere are created by the type of, and variations in, the process, by selective settling, differential disintegration, and by factors outside the process itself that may have direct effects.

If occupational exposures are involved, the problem is potentially a "real hazard." The dustiness of the atmosphere is estimated for any or all of several reasons:

1. To evaluate or "index" the occupational dust exposures and the general air conditions of an industrial establishment.

2. By correlating these findings with medical studies on the same occupations; to establish a safe upper or permissible limit of dustiness.

3. To aid in the design, to determine the effectiveness, and to assist in the continued efficient operation of dust control equipment.

After making a thorough survey, the method and sampling instrument that

TABLE 1

Dust Counts Classified According to Type of Drilling Granite Quarries. No Dust Control

Dust Counts in Millions of Particles per Cubic Foot of Air (Light Field Technic)

Type of Operation	*Average Drilling*	*Maximum Drilling*	*Minimum Drilling*	*Weighted Year-round Average*
Leyner drilling	141	339	24	85
Jack-hammer	131	324	21	70
Plug drilling	69	217	10	50

are best adapted to the conditions of the problem are selected. Often practical considerations are the factors that decide the choice. We realize that no method of dust estimation yields results that are absolute. However, if the procedure demonstrates high efficiencies within the range of particle sizes that are of hygienic significance and results that can be duplicated, it can in effect be calibrated against medical findings.

A study,* completed recently, of the granite quarries in Vermont illustrates a typical industrial dust problem. The occupations involved exposure to dust produced by drilling with pneumatic or compressed-air driven tools. The work was variable and the dust concentrations were influenced directly by the type of drilling, location, weather conditions, and other operations in the vicinity.

In selecting a method for estimating the exposure of these occupations, the hazardous nature of the dust, the high varying concentrations present, and the fact that a permissable limit of dustiness was to be determined had to be considered. The procedure of dust estimation that adapted itself best to the requirements was the slow sampling method using a modified Greenburg-Smith impinger. Power for an electric precipitator was not available.

On the basis of medical information obtained from the same group a limit of 10 million dust particles per cubic foot was established and ventilating equipment to reduce the dust concentrations to below this level were experimented with and tested. A dust control apparatus of the local exhaust type was developed specifically for quarry drilling operations. By designing this machine for a total static pressure of less than 20 inches of water gauge, the cost of manufacture of such a low pressure system proved to be less than one-half the cost of a commercial high pressure or vacuum system for the same application. Repeated tests now showed the dust concentration in the working atmosphere to be consistently less than 5 million particles per cubic foot.

With the use of control apparatus the high dust concentrations were obviously reduced to a low level and their wide variations for the most part eliminated.

Rapid or grab sampling instruments for evaluating air dustiness find wide use in applications of this type. They are compact, easy to operate, and in low dust concentrations give a reliable index.

In general dust control work, where periodic routine inspections are necessary, they prove very effective for checking on the maintenance of dust control programs, particularly when used in conjunction with ventilation determinations.

* The Granite Quarries of Vermont, 1939. Office of Industrial Hygiene, State Department of Health, Barre, Vt.

Rapid Methods for the Determination of Gases in the Air*

F. A. PATTY

Director of Industrial Hygiene, Fidelity & Casualty Company of New York, New York, N. Y.

AIR analysis is a complex problem that does not lend itself readily to a complete standardization. The variations and combinations of gaseous contaminants are too extensive to permit of covering all the possibilities, and for that reason no rigid and fixed routine can be set for analytical procedures. For the determination of a particular contaminant or group of contaminants, however, various practical methods can be assimilated and tabulated. This has been well done by the Subcommittee on Chemical Methods in Air Analysis and reported in American Public Health Association *Year Books*.[1, 2] Similar work has been accomplished by the Air Hygiene Foundation.[3] The choice of a method or combination of methods must be left to the judgment of the analyst. Frequently no satisfactory method is recorded for a particular problem, in which case success is governed by the ingenuity of the investigator in devising a method based on known physical properties and chemical reactions.

In the selection of a method, consideration must be given to the particular problem at hand. If the situation involves only the control of contamination in an industrial plant it matters little whether the analytical method used yields results accurate within ± 5 per cent or 25 per cent. In some instances, results accurate to within 50 per cent are satisfactory for control work. Our physiological threshold limits in many instances are not sufficiently definitely established to require greater accuracy. Also we should strive for a considerable safety factor rather than be satisfied with an atmosphere contaminated to the highest point believed compatible with health.

On the other hand, however, if we plan to record our findings as a guide to others, we should thoroughly investigate analytical procedures and select only those yielding accurate and dependable results. In either case, the method should be tried out with synthetic atmospheres in the laboratory prepared to simulate those of which analyses are to be made. It is very essential that the investigator know from experience with prepared atmospheres just what the method will yield under his manipulation. Air analysis should not be entrusted to "cookbook" chemistry and the blind following of printed instructions with little regard for the dependability of results.

Some reports on the toxic action of gases ignore chemical data necessary to establish concentrations of air contaminants. The report that makes no mention of analytical methods or merely states "analyses were made by standard

* Read before the Industrial Hygiene Section of the American Public Health Association at the Sixty-eighth Annual Meeting in Pittsburgh, Pa., October 19, 1939.

methods" is not convincing, and unless dependable analytical data are presented, thinking men are not likely to be impressed by the results. Likewise the report showing the use of a method which has not been adequately tested injects cause for questioning. Too often so-called threshold limits are set up by some group without the necessary data and proof of analytical dependability. This only adds confusion.

METHODS OF DETECTION AND ESTIMATION

1. ODOR

The most universally available rapid method of detecting and estimating gaseous contamination is by odor, and it behooves the industrial hygienist to determine early in his career just what and how much he can recognize by the sense of smell. Individual sensitivity to odors varies considerably, and fatigue occurs rapidly, but the individual notation of the initial odor of known concentrations is an extremely valuable qualitative and quantitative guide in air analysis for gases and vapors. There is a need for more data on odor intensities.[4, 5, 6]

2. CHEMICAL METHODS

Samples may be measured and collected by aspiration through the test material or absorption media by means of water displacement, a calibrated rubber bulb, piston type hand pump, or through a flow meter by any suction device. Another very convenient method of sampling is the partly evacuated bottle of 1 to 20 liters. Evacuation is conveniently done in the field by use of the hand pump and measured on a dial type gauge. The sample may then be absorbed by agitation with suitable absorption media or a direct determination may be made in the bottle by addition of reagents.

Chemical methods that are rapid and relatively easy to manipulate usually depend upon a color reaction and are frequently adjusted to indicate concentrations by the appearance or disappearance of a color or turbidity during sampling. Some examples are the iodometric determination of hydrogen cyanide, hydrogen sulfide and sulfur dioxide by aspiration of a few liters of atmosphere through a scrubber containing potassium iodide-starch solution and a measured amount of 0.002 normal iodine in which disappearance of blue color marks completion of the test; the determination of chlorine by aspirating the atmosphere through a postassium iodide-starch solution containing a measured amount of 0.002 normal sodium thiosulfate in which appearance of a blue color marks the end point; the determination of ammonia by aspirating the air through water containing methyl red and a measured amount of 0.01 normal sulfuric acid until the color of the indicator changes; the determination of acid gases and vapors such as hydrochloric, hydrofluoric, hydrobromic, formic, and acetic by aspirating through 0.01 normal sodium hydroxide and an appropriate indicator such as methyl red. In the case of hydrofluoric acid the scrubber must be coated throughout with paraffin. Controls should always be made with uncontaminated air. These tests are method or adaptations based on methods used by the U. S. Bureau of Mines for testing gas masks.[7]

The phosgene test paper method employing paper dipped in an alcoholic solution of para-dimethylaminobenzaldehyde and diphenylamine may be added to this group. We have found, by means of synthetic atmospheres made in our laboratory, that the phosgene test paper method is more reliable and satisfactory than other published methods for the determination of phosgene in concentrations of ½ to 2 p.p.m. When the paper is suspended in the atmosphere, ½ p.p.m. phosgene pro-

duces a light lemon yellow color in 4–5 minutes and a dark yellow in 10–15 minutes. Higher concentrations produce proportionately greater color changes up to a dark orange shade which occurs in about 8 minutes with 2 p.p.m., and 15 minutes with 1 p.p.m. The effects of temperature, humidity, and air motion were not studied. Chlorine and hydrochloric acid give similar reactions. Incidentally, it was noted that to the average individual 1 p.p.m. phosgene is easily noticeable by odor and ½ p.p.m. is detectable by a faint characteristic odor; the same odor evident whenever a chlorinated hydrocarbon comes in contact with a flame. In neither case is there a distinct irritation of eyes, nose, or throat. For higher concentrations of phosgene, the atmosphere is aspirated through saturated aniline water.[8] Evaluation can be made by comparison of turbidity with standards or by weighing the precipitated diphenyl urea.

Other rapid chemical tests employing a similar technic and using a piston type hand pump to aspirate the sample are the lead acetate test paper method for hydrogen sulfide, the benzidine-copper acetate and congo red-silver nitrate test paper methods for hydrogen cyanide, the potassium iodide-iodate test paper for sulfur dioxide and the sulphanilic acid-alpha naphthalamine test solution method for nitrogen oxides all of which are recommended by the Department of Industrial Research, London.[9] These methods have been arranged for rapid field tests, and concentrations are computed from the number of piston strokes necessary to match a certain definite color on the test paper or solution.

Ozone in the air may be satisfactorily determined [10] in the absence of interfering gases by drawing the air sample through alkaline potassium iodide-starch solution, acidifying with sulfuric acid and discharging the color with a measured amount of standard sodium thiosulfate solution.

Arsine can be detected by passing the contaminated air over lead acetate solution to remove sulfides, then over test papers [11] dipped in 5 per cent mercuric chloride. It is probable that this method will prove satisfactory for rapid semi-quantitative work when standards have been prepared. The method is said to produce a distinct yellow color in concentrations of 10 p.p.m.[12] Arsine, stibine, and phosphine also color silver nitrate paper. Arsine [13] produces with silver nitrate a yellow color changing to black, while stibine and phosphine both produce black. The limit of sensitivity of these color reactions is of the order of 1 p.p.m.

Formaldehyde may be determined by collection in water, employing three scrubbers in series or better, a partly evacuated bottle, adding Schiff's-Elvove reagent and comparing the resultant color with that of formaldehyde standards.[14]

Carbon dioxide in the absence of other volatile acids or bases may be determined continuously by aspiration of the atmosphere through a standard sodium bicarbonate solution containing an indicator such as phenolsulphonthalein. The color changes are compared to standards and are independent of the volume of air aspirated.[15] This same method can be applied to the determination of certain combustible gases containing carbon atoms. In this instance, carbon dioxide must first be removed from the atmosphere and then the combustibles completely oxidized by suitable means such as a hot wire spiral, after which the resultant carbon dioxide is determined. The determination can be continuously registered by photo-electric means if desired.[16]

Carbon dioxide, oxygen, nitrogen, carbon monoxide, and hydrocarbons may be readily and quickly determined by means of the portable water Orsat [17]

with an accuracy of approximately 0.2 per cent by volume.

A practical improvised method for the determination of carbon dioxide and oxygen by means of a hypodermic syringe has been described by Henderson.[18]

Concentrations of oxygen below 16 per cent can readily be detected by the flame safety lamp [19] or in the assured absence of combustibles, by means of a lighted candle, which ordinarily extinguishes in less than 16.5 per cent oxygen.

The M.S.A.[20] hydrogen sulfide and hydrogen cyanide detectors, employing aspirating bulbs to measure the volume of air sampled, indicate concentrations by the length of coloration in the indicator tubes. Sufficiently accurate results for control work may be obtained rapidly with these detectors.

The Hoolamite, or iodine pentoxide-sulfuric acid detector for carbon monoxide, though yielding rapid results, is perhaps not as sensitive as the palladium chloride ampoules which are fairly reliable at ordinary temperatures. For greater accuracy and dependability however, the M.S.A. carbon monoxide indicator employing a catalyst, hopcalite, is much more desirable. In this instrument, carbon monoxide is oxidized to carbon dioxide with evolution of heat which is measured by thermocouples and a meter. This indicator should be checked periodically with a 0.1 per cent carbon monoxide air mixture, and in the case of very important determinations, it should be checked before and after use.

Several of these aforementioned tests are influenced by interfering gases or vapors and therefore cannot always be depended upon to yield results of great accuracy, but they are all useful in control work.

The halide leak detector,[21] a methanol torch with sampling tube and copper cone, can be used to detect organic or inorganic halogen vapors qualitatively and has been proposed as a semi-quantitative measure for some halogenated hydrocarbons.[22, 11] In this device, halogens impart a blue green color to a flame contacting a copper cone. The intensity of the color increases with the concentration of halogen.

3. PHYSICAL MEANS

The most useful of all physical methods for determining gases is the interferometer. It can be used to determine any gas, but in industrial hygiene it is especially adaptable to the relatively inert gases with refractive indices sufficiently different from that of air, the usual standard of comparison. The accuracy of the interferometer increases with the refractivity of the gas and the length of the gas chamber. The 50 cm. instrument with metal gas chambers is readily portable and satisfactory for field use. Almost instantaneous results are obtained, permitting the determination of maximum, minimum, and average concentrations, or the following of a changing concentration through its cycles. Concentrations can be computed from interferometer readings and refractivity data.[23] When the refractivities and relative proportions of the components of a mixture are known, the actual percentage of each can be computed from the interferometer reading. Here, as in the charcoal and silica gel absorption methods for solvent vapors, water vapor and carbon dioxide must either be removed or taken into account. Unfortunately, soda lime and dehydrating agents usually employed remove many gases and vapors which otherwise might be satisfactorily determined. Notable among the vapors partly or completely lost by methods based on initial removal of water vapor and carbon dioxide, are methyl and ethyl cellosolve, esters, lower alcohols, pyridine, dioxane, furfural and dichloroethyl ether.

Another convenient instrument is the combustible gas indicator which is available in a variety of sizes and types. Although some of these instruments have a high sensitivity, their greatest field of application is in the higher concentrations—upward of 0.1 per cent gas by volume. They are especially useful in locating sources of contaminating gases and vapors in fire and explosion prevention, but have their application also to industrial hygiene surveys. Automatic types for continuous [20] control or recording are available.

A method based on selective light wave absorption has been developed and applied to the field determination of gases and vapors, especially mercury [24] and trichloroethylene.[25] The instruments used are very sensitive ultra-violet photometers and their operation depends upon the specific absorption of bands of ultra-violet light by certain vapors. The Tri-Per-Analyzer (Dupont) is said to have the following sensitivity in the p.p.m. per scale division:

Mercury, 0.0001; tetraethyl lead, 0.13; xylene, 0.2; monochlorobenzene, 0.3; aniline, 0.3; perchlorethylene, 0.5; toluene, 1.0; chloroprene, 1.0; benzene, 1.2; vinyl acetylene, 2.0; phosgene, 5.; acetone, 5.; ethylbenzene, 5.; pentachlorethane, 7.; hydrogen sulfide, 8.; trichloroethylene, 10.; carbon disulphide, 12.; heptane, 25.; gasoline (Blue Sonoco), 50.

The device does not respond to:

Methylene chloride; carbon tetrachloride; dichloro-difluoro methane; ethylene dichloride; tetrachlorethane; chloroform; methyl chloride; vinyl chloride; methyl, ethyl, and amyl alcohol; ethyl acetate; ethyl and methyl cellosolve; water vapor.

Other research now in progress indicates that selective absorption in the infra-red and radio wave ranges will permit of high selectivity with screening out of interference.

A method employing vapor tension for the determination of solvent vapors has recently been developed.[26, 27] It may prove practical for field use.

Thermal conductivity [28] has been successfully applied in the analysis of certain gases. Although it serves as a rapid continuous recording method, it is not available in a portable field device.

The Edwards Gas Density Balance [29] for determining slight changes in density between air and gas-air mixtures is useful and rapid in gas analysis but is not sufficiently accurate for the threshold concentrations of most toxic gases.

SUMMARY

The determination of gases in the air can be accomplished by various methods which should be selected to fit the particular situation encountered. Convenience, speed, accuracy, and portability are the most important qualifications. All analytical methods should be tried in synthetic atmospheres in the laboratory before use in the field. The ability to recognize odors and their intensity is a material aid. Many of the rapid methods which may not give a high degree of accuracy are yet entirely suited to routine industrial hygiene work. Specific methods are discussed.

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DISCUSSION

L. B. BERGER

Associate Chemist, United States Bureau of Mines, Experiment Station, Pittsburgh, Pa.

IN the introductory portions of his paper Mr. Patty has presented concisely an excellent portrayal of the problems confronting the industrial hygienist in the field of air analysis. He has emphasized the fact that no set rules of procedure can be laid down because of the complexity of the situations that may arise, and that for this reason workers in this field have need for ingenuity and resourcefulness to conduct their studies successfully. One is constantly faced by combinations and variations of conditions that demand a thorough understanding of the principles involved in the various analytical procedures if reliable results are to be obtained and a true picture of the situation secured. Consideration must be given to all the conditions that may attend contamination of the atmosphere; for example, sampling an atmosphere containing vapors of volatile liquids constitutes one type of problem, that is, the selection of suitable methods for determining these vapors, regarding them as identical with the materials from which they had their source, but existing in the vapor phase rather than the liquid. However, if the air is contaminated by products of combustion or thermal decomposition, an entirely different situation exists, and due consideration must be given to all the possible products that may result from the reactions involved.

This paper also calls attention to the distinction that may be drawn between

field surveys and research conducted in the laboratory. In survey work interest is often centered mainly in the order of the concentrations of atmospheric contaminants rather than in their determination with the ultimate degree of accuracy. This is not intended as condoning careless or slipshod work, but is meant to show that time and energy may be wasted in trying to make determinations accurate to 1 per cent, when conditions may change 100 per cent in a very short interval. The conduct of research to secure fundamental information is a different matter; in work of this nature too much emphasis cannot be placed on accuracy in analytical work. As Mr. Patty has stated, confidence in published data diminishes rapidly if the reader is not convinced from the start that the analytical part of the investigation has been carried on in a manner above suspicion. This is true, not only in the field of industrial hygiene, but in any field where conclusions must be drawn largely from conditions established or determined by analytical results.

Another point in this paper worthy of comment is the mention of need for careful study and experimentation with any analytical method in the laboratory before it is applied in field surveys. The actual analysis of synthetic mixtures is the best practical approach to a full understanding of a method. In many instances an hour's manipulation of apparatus is worth more than a week spent in reading a description of the procedure. Furthermore, experience in technic gained in the laboratory may give rise to new ideas for design or manipulation that will simplify operations when the method is applied in field studies. It is far better to learn the limitations of an analytical method in the laboratory, and thus know the uses to which it can be put, than to start a survey in the field with an untried method and find that it has shortcomings that may render it entirely inadequate for the situation at hand.

Mr. Patty has stressed the importance of learning to evaluate concentrations of odorous materials by the sense of smell. Although not an infallible method, estimation by odor intensity is often a most valuable guide, and in many instances may give the practical answer to problems that arise in industry, without further investigation. For example, if air contains ammonia, the investigator knows, without question, after one or two inhalations of the atmosphere whether the odor is faint, moderate, strong, or intolerable. If the odor intensity is such that it cannot be borne without discomfort, obviously the thing to do is to correct the situation by removing the source of contamination or by increasing ventilation. Analysis of the air will produce some figures for the records, which may be of academic interest, but it will not rid the atmosphere of ammonia which, after all, was the ultimate necessity.

A number of methods of air sampling, applicable in industrial hygiene field surveys, have been described. In determining atmospheric contaminants, the investigator should always bear in mind that, to obtain reliable results, just as much thought and care must be exercised in sampling as in analysis. If air samples are not properly collected and are not representative of the atmosphere sampled, the analytical results will be in error, no matter how excellent the analytical method, nor how careful and painstaking the analyst may be. In other words, the results can be no better than the samples. In selection of sampling methods consideration must be given to the physical and chemical properties of the materials to be sampled, as serious errors may result from ignoring factors such as solubility or reactivity of the gases in question. I recall an oversight of this nature that serves as an excellent example of what

not to do. A man collected samples of air for determination of sulfur dioxide by filling bottles with water and emptying them at the desired locations. When informed that this method of sampling was not suitable when sulfur dioxide was to be determined, he replied that he could not see why the samples were not all right, as he had used pure, distilled water to fill those bottles. He had entirely overlooked the fact that sulfur dioxide is quite soluble in water, and that as the water was discharged from the bottles it would dissolve, and carry with it, a large proportion of the sulfur dioxide in the air.

Mr. Patty has called attention to portable indicating or analyzing devices that may be used to advantage. Among instruments of this type are the interferometer, the carbon monoxide indicator, combustible gas indicator, and detectors for hydrogen sulfide and hydrogen cyanide. Devices of this nature are decidedly advantageous in field studies as they permit the investigator to locate localized high concentrations of contaminants in atmospheres that are not homogeneous, whereas in collecting samples for subsequent chemical analysis there is always the possibility that these high concentrations may have been missed.

Furthermore, the indications furnished by these instruments give an immediate answer to the problem at hand, and in many instances are sufficiently accurate to warrant dispensing with time consuming collection and analysis of samples.

However, in using these devices one should not fall into the habit of regarding them as infallible and self-sufficient instruments that require no more attention from the operator than the closing of a switch or the compressing of a rubber bulb. They should be regarded in the same light as any other analytical methods, requiring the same degree of care in operation if reliable results are to be obtained. The operating principles should be studied thoroughly so that the user is entirely familiar with the possible applications and the limitations of these instruments.

Mr. Patty is to be commended for the amount of information he has included in this paper, and for the fact that he has contributed freely from his own studies and observations.

The Problem of Malaria Mortality*

H. W. BROWN, M.D.

Professor of Public Health, Division of Public Health, University of North Carolina, Chapel Hill, N. C.

DESPITE four decades of malaria prevention through mosquito eradication, from 2,500 to 4,500 deaths per year are certified in the United States as due to malaria. In the past 10 years 37,073 deaths from malaria have been reported. Authorities estimate that from 1,000,000 to 4,000,000 persons suffer from this disease annually in the United States. It is evident that the malaria problem is still unsolved and that anything approaching complete elimination through the eradication of its mosquito vector will be a long procedure. The problem of malaria deaths warrants an immediate, direct attack.

It is paradoxical that we should have such a large number of deaths from malaria, a disease in which an accurate, rapid diagnosis is usually relatively easy, in addition to the fact that it is one of the few diseases for which we have specific drugs. If the diagnosis and treatment were obscure and ineffective, the excessive malaria mortality could be accounted for as a natural consequence; such is not the case. The question at once arises as to why the malaria death rate in Southern United States remains so high.

It is commonly held by the population in the malarious areas that they are well qualified by experience and close association with malaria both to diagnose the disease and adequately treat it. In endemic areas, fever or chills, of whatever source or type are usually attributed to "a touch of malaria" and frequently little attention is given the illness, which is considered of minor importance and placed in the same category as the common cold; yet thousands of these people die annually from malaria. Why is the malaria death rate in the Negro, reputedly partially immune to at least one species of parasite, usually much higher than that of the white race in the same areas? What are the habits, environmental, and economic conditions of the Negro that lead to such a different death rate?

Unquestionably, early diagnosis and adequate therapy are essential to successful treatment of malaria and the prevention of death. How important in the causation of malaria deaths is the failure to seek an early diagnosis? What are the important factors responsible for the delay in seeking medical aid? Once medical aid is obtained and the diagnosis made how adequate is the treatment?

The data upon which this discussion is based were secured from questionnaires sent to Georgia physicians certifying malaria as the cause of death of patients during the summer and fall of 1937. The questionnaires were mailed

* Read before the Epidemiology Section of the American Public Health Association at the Sixty-eighth Annual Meeting in Pittsburgh, Pa., October 17, 1939.

This study was initiated while the author was an officer of the U. S. Public Health Service.

as soon as the death certificates were received by the State Department of Health.* Information upon 101 persons reported to have died from malaria was secured; 53 white and 48 colored; 53 males and 48 females. A questionnaire filled out by a physician who was not anticipating the questions when treating the patient is open to inaccuracies. Data that the physicians indicated were questionable were omitted in tabulating the results.

The group studied represents a fair cross-section of the type of person dying from malaria in this country. The medical facilities available to them are typical of our South. Their habits of self-medication and the diagnosis and treatment given by their physicians probably are not greatly unlike that common in the rural South, the endemic center of malaria in the United States.

The age distribution is shown in Table 2. The greatest number of deaths occurred in children under 5 years and adults past middle age; the lowest in the 5–9 and 10–14 year age groups. Thus our sample, though small, has an age distribution and, in general, a death rate similar to the distribution of malaria deaths for the country as a whole.

TABLE 1

Malaria Mortality U. S. Registration Area, 1928–1937

Year	White	Negro	Total
1928	2,170	1,997	4,167
1929	2,176	1,908	4,084
1930	1,669	1,734	3,403
1931	1,310	1,226	2,536
1932	1,308	1,260	2,568
1933	2,675	2,003	4,678
1934	2,493	2,027	4,530
1935	2,575	1,860	4,435
1936	2,145	1,798	3,943
1937			2,729
			37,073

LENGTH OF TIME PATIENT WAS ILL BEFORE CALLING A PHYSICIAN

In any disease for which a specific treatment is available the prime requisites for successful cure are early diagnosis and treatment. Our data indicate they are frequently neglected by those who later succumb to malaria (Table 3).

TABLE 2

Age Distribution of Types of Malaria and Complications Encountered

Age →	Under 1	1–4	5–9	10–14	15–19	20–24	25–34	35–44	45–54	55–64	65+	Total
Age distribution of patients' deaths	5	7	3	2	5	11	13	9	14	12	17	101
Cerebral malaria	4	5	3	1	1	3	4	3	5	3	5	37
Hemoglobinuria	1	2	2	1	2	2	3	4	2	3	0	22
Complications												
Pneumonia	0	2	0	0	0	2	2	3	1	1	1	12
Nephritis	0	1	0	0	0	1	1	4	1	0	1	9
Cardiac disease	0	0	0	0	1	0	1	0	2	1	9	14
All other	2	2	0	0	2	0	4	0	3	3	3	19
Complications all types Males	0	2	0	0	1	2	2	1	5	1	10	25
Complications all types Females	2	3	0	0	2	1	6	6	2	4	4	30

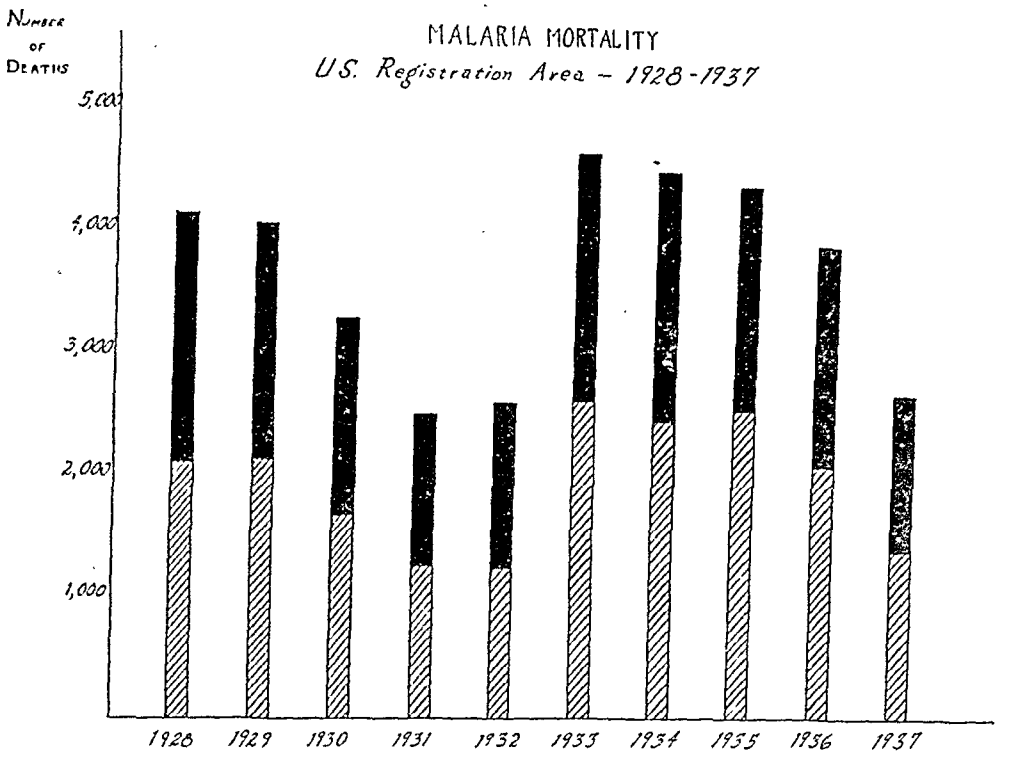
TABLE 3

Duration of Illness Before Calling a Physician

	Days Ill							
	1–2	3–6	7–14	15–21	22–28	29+	Not Given	Total Cases
Males	16	6	13	3	0	6	6	53
Females	7	6	17	4	1	6	11	48

*I [illegible] to Dr. R. P. [illegible] Health and Butler [illegible] Bureau of Vital Statistics, for [illegible]

FIGURE 1



Approximately 50 per cent of the whites and 75 per cent of the Negroes were ill a week or longer before calling a physician, and no less than 13 per cent of the whites and 16 per cent of the Negroes were sick a month before seeking medical aid. Approximately 10 per cent of the patients died the day a physician was first called, and 28 per cent died within 2 days after. A number were moribund and the most rapid diagnosis and skillful treatment would have been without avail. On the other hand 34 per cent of the whites and 8 per cent of the Negroes called a doctor during the first 2 days of illness and, despite early diagnosis and treatment, died. Nineteen per cent of the whites and 16 per cent of the Negroes called a doctor from the 3rd to 6th day of illness. In such instances one suspects that either the strain of malaria was unusually lethal or that treatment was not sufficiently vigorous.

It is interesting and quite significant that the Negroes in general were ill much longer than the whites before seeking medical aid, probably an important factor in the high death rate from malaria among Negroes. It is possible that the Negro, with his relative immunity to at least one species of parasite, particularly benign tertian, may suffer less symptomatically from malaria and hence be slower to feel the need of medical aid. It is also unquestionable that ignorance and poverty play an important rôle in delayed medical attention for the Negro. A farm laborer earning a dollar a day or less feels he cannot afford the luxury of medical care for what he considers a minor ailment such as chills and fever.

It is unfortunate that many persons when told they have malaria feel that all that is necessary to control this "natural and mild infection" is a few doses of chill tonic or a round or two of quinine.

SELF-MEDICATION BEFORE CALLING A PHYSICIAN

Sixty-seven per cent of the group studied (57 per cent of the whites and 79 per cent of the Negroes) took some form of anti-malaria treatment before consulting a doctor. Self-medication was slightly more common among the females of both races than among the males.

Data were secured on the specific anti-malaria self-medication of 38 of the 68 persons indulging in self-medication (Table 4). Of the 38 persons, 18 were whites and 20 Negroes. Half of the Negroes took chill tonic and half took quinine. The whites preferred quinine, 12 using it while 4 took chill tonic, and 2 atabrine.

That the Negroes frequently resorted to chill tonic may be a factor in their high death rate from malaria. The amount of quinine in the recommended dose of chill tonic is frequently insufficient to check severe malaria. In general the amount of quinine taken was insufficient—5 to 15 grains was the usual daily dose. No information on the exact dosage of chill tonic or atabrine was available. Nineteen of the 22 persons using self-medication for various lengths of time showed malaria organisms in their blood, which, with the fact that they continued to have symptoms, grew progressively weaker, and finally consulted a physician, is conclusive evidence of the inadequacy of the self-medication employed.

The median length of time before seeking medical aid for those indulging in self-medication was 10 days and for those who refrained from self-medication 3 days. It is apparent that self-treatment may be an important factor and delay to a marked extent correct diagnosis and proper treatment. Doubtless much of the self-medication and delay in seeking medical attention is due to the expense. On the other hand, continuous contact with malaria and the never ending statements through newspaper, radio and billboard of the efficacy of chill tonics have lulled the rural South into a sense of false security. In order to combat this feeling these people must be educated to the fact that malaria is a serious disease and not infrequently terminates fatally. It should be emphasized that early diagnosis and a rapid thorough treatment are necessary. In 33 instances, no anti-malaria drugs were taken before calling a physician. The majority of these persons were ill only a day or two before seeking medical attention. On the other hand, 10 persons experienced chills and fever for 1 to 4 weeks before calling a doctor and, during this time, according to the doctor's statement, took no anti-malaria medication.

Of the 33 persons refraining from self-medication 23 were white and 10 were Negroes. Due to the widespread knowledge of cause and treatment of chills in the malarious areas one would expect the whites to rely more on self-medication than the figures indicate (see Table 4). However, much of the apparent failure to attempt self-cure among the whites was probably due to the fact that many of them did not recognize the nature of their disease and therefore sought medical attention after a day or two of sickness.

TABLE 4

Self Medication Before Consulting a Physician

	Quinine	*Chill Tonic*	*Atabrine*	*Drug Not Specified*	*None*	*Total*
White	12	4	2	12	23	53
Negro	10	10	0	18	10	48

MEDICAL SERVICE TO PATIENTS DYING OF MALARIA

If malaria deaths are to be prevented early diagnosis and adequate therapy is essential. Unfortunately such procedures are frequently neglected, but a large proportion of those dying were under medical supervision for a considerable period. Fourteen persons (14 per cent of the total) died a month or longer after seeking medical advice (Table 5).

TABLE 5

Duration of Treatment under Physician's Direction Before Death

	Days →	*0–2*	*3–6*	*7–14*	*15–21*	*22–28*	*29+*	*Not Given*	*Total*
White		12	15	11	1	0	5	9	53
Negro		11	9	11	4	2	9	2	48

It is generally held by malariologists that malaria patients under a physician's care for 2 weeks if treated adequately rarely die of malaria. In hospital practice or among persons who can afford constant medical supervision this may be the case, but in a rural population of low economic level "under a doctor's care" often means a single trip to his office and a prescription. This is about all that can be afforded by most rural laborers and tenants. Unfortunately the diagnosis of malaria is often hailed with relief by the patient who feels adequately informed to treat his own disease. Occasionally doctors hold the same belief.

Quinine was the doctor's drug of first choice in the treatment of the patients in our series, and was prescribed in approximately two-thirds of the cases.

Drug	*Patients*
Quinine	56
Atabrine	17
Quinine and Atabrine	8
Atabrine and Plasmoquine	3
Quinine, Atabrine and Plasmoquine	1
Chill Tonic	2
Not Stated	8
No Medication	6
Total	101

Atabrine and quinine with atabrine were also used in approximately one-fourth of the cases. No anti-malaria drug was administered to 6 patients as death occurred before treatment could be instituted. It is comforting and an indication of progress to note the infrequent prescribing of chill tonics.

Treatment was given by mouth in 70 per cent of the cases and intravenously, intramuscularly, alone or in combination with oral administration in the remainder. Intravenous and intramuscular medication was twice as frequent among the whites as among the Negroes.

Approximately 40 per cent of 78 persons about whom complete information was secured did not receive what is considered by international malaria authorities adequate therapy to control a severe attack of malaria. Approximately 30 per cent of the whites and 50 per cent of the Negroes were not adequately treated. The inadequacy of treatment of Negroes may explain in part, their high death rate from malaria.

Meleney [1] found that approximately 50 per cent of those dying of malaria in Tennessee in 1935 were given inadequate treatment. His figures are confirmed by our data and suggest that this condition, which has been found in 2 states, may be present in other sections of the malaria region of the South.

Blood smear examinations were made in diagnosis in 52 of the 101 cases—47 were positive. Meleney reported that blood examination was done by the doctors in approximately 40 per cent of the cases of malaria in Tennessee that terminated fatally. Dauer and Faust [2] reported that blood examinations were

made in 34 per cent of the whites and 29 per cent of the Negroes dying of malaria in Mississippi. In our series, blood examinations were made 50 per cent more frequently in whites than in Negroes. Thirty-one were made by the physician, 9 by the hospital laboratory or private technician, 7 by city laboratories, and 4 by the state laboratory. Of the positive blood smears 47 per cent were classified as *Plasmodium falciparum*, 44.4 per cent *Plasmodium vivax*, 4.4 per cent *Plasmodium malariae*, and 2.2 per cent as mixed *Plasmodium vivax and Plasmodium falciparum* (Table 6). Such an incidence of *Plasmodium vivax*, as the cause of death in adults is most unusual and suggests two possibilities: either an unusually pernicious type of *Plasmodium vivax* or error in diagnosing the species. The fact that death of 7 Negroes was attributed to *Plasmodium vivax*, a species to which they possess some immunity, while only 9 were attributed to *Plasmodium falciparum* suggests the possibility of error in diagnosis. I am inclined to agree with a number of malariologists who consider a large percentage of malaria deaths in adults attributed to *Plasmodium vivax* as errors in species diagnosis. This question could be readily solved by sending the blood smears to the state laboratory for confirmation. None of the blood of the cases in this series examined by the state laboratory contained *Plasmodium vivax*.

TABLE 6

Species of Malaria Parasite Reported Found in Blood Examination

Species →	*P. Vivax*	*P. Falciparum*	*P. Vivax and P. Falciparum*	*P. Malariae*	*Not Given*	*Neg.*	*Total*
White	13	14	0	0	0	5	32
Negro	7	9	1	2	1	0	20

Complications were reported in 55 of the 101 patients (Table 2). Cardiac disease (14 times) and pneumonia (12 times) were the most common complications. Acute nephritis was reported 9 times. Other complications noted twice or oftener were cerebral hemorrhage, influenza, and acute intestinal disturbances. The cardiac complications were most common in the age group 65 and over, and were not reported in any individuals under 15 years of age. In general, complications were most frequent in the very young and old groups. No complications were reported in the 5–14 age group.

Complications occurred with equal frequency among the males and females. Whereas they occurred most frequently in males 65 and over, among the females the greatest frequency was among the 25–44 year age group. Nephritis was the most common complication of this group. Whites and Negroes had approximately equal complication rates.

Twenty-two of the 101 cases were described as hemoglobinuric, with the condition approximately twice as common among whites as Negroes (Table 7). Of the cases reported as hemoglobinuric 6 were attributed to *Plasmodium falciparum*, 5 to *Plasmodium vivax*, 1 to a mixed infection of the two,

TABLE 7

Occurrence of Hemoglobinuria in Relation to Species of Parasite

	P. Vivax	*P. Falciparum*	*P. Vivax and P. Falciparum*	*P. Malariae*	*Species Unknown*	*Total*
White	3	4	0	0	7	14
Negro	2	2	1	1	2	8

and 1 to *Plasmodium malariae* (Table 7). The absence of hemoglobinuria in any of the 17 persons over 65 is of especial interest (Table 2). No record of the species of malaria was available in the remaining 10 cases.

Cerebral manifestations were reported in 37 instances. In patients infected with *Plasmodium vivax* as well as those with *Plasmodium falciparum* stupor and convulsions were most common in children, while stupor followed by coma was the characteristic picture in adults. Twelve of 15 children under 9 years dying of malaria exhibited cerebral manifestations of the disease. A number of patients did not come under the care of a physician until comatose.

DISCUSSION

Diagnosis of malaria should be based upon blood examination. Chills and fevers are too frequently associated with other diseases to serve as the sole criterion for diagnosis. The present study revealed that blood examinations were resorted to in 51 per cent of the cases. This no doubt represents a considerable increase over blood smear diagnosis for malaria as practised twenty years ago. One however is tempted to question the accuracy of the species diagnosis, for *Plasmodium vivax* was reported as the cause of fatal infection approximately as frequently as was *Plasmodium falciparum*. This is strongly indicative of diagnostic error for it is generally agreed by malariologists that *Plasmodium vivax* seldom causes death except in the very young or old. It is often argued that malaria is malaria and the same quinine treatment will cure all three types, so why bother about the species. It is important, however, for a physician to know when he is dealing with the malignant tertian (*Plasmodium falciparum*) in order that he may follow and treat the patient vigorously and to best advantage.

It is true that quinine will destroy the asexual forms of all three malaria plasmodia. On the other hand, it is only slightly destructive of the gametocytes of *Plasmodium vivax* and *Plasmodium malariae*. Quinine has little or no effect upon the gametocytes of *Plasmodium falciparum*.

Inadequate therapy by the physician was unquestionably the important factor in the death of a number of the patients in the present series. Meleney [1] attributes the death of 40 per cent of his malaria series to this cause.

Failure to use adequate therapy along with inaccurate or no blood examination is a reflection on medical education. The biology, diagnosis, and treatment of parasitic diseases including malaria are badly neglected in many medical schools including those in the South. Doctors are graduated who do not know a malaria infected red blood cell from a small lymphocyte or a platelet superimposed on a red cell. The Chicago amebic dysentery epidemic and its humiliating sequellae along with the malaria mortality should be sufficient to convince the skeptical of the importance of knowledge of these and other parasitic diseases. Education of men in practice is necessary, since many of them have a meager background concerning malaria. This may be done through their medical society meetings, special lectures, demonstrations, etc. State departments of health can coöperate in this education, through lending specialists to address and demonstrate procedures to various medical groups. The county health officer could be equipped to stain and diagnose malaria and offer this educational service to the physicians in his area.

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Further Observations on the Rapid Phosphatase Test*

H. SCHARER

Chemical Laboratory, Bureau of Food and Drugs, Department of Health, New York, N. Y.

THE importance attached to pasteurization by medical science and public health officials warrants every effort to establish effective means for controlling the process. The reliance which consumers place on the term "pasteurized milk" requires constant vigilance by public health administrators and the dairy industry that regulations governing this procedure be strictly enforced. Some plants in operation today are capable of pasteurizing in excess of 25,000 quarts of milk per hour and many have a capacity of 5,000 quarts per hour. These significant engineering advances must be followed by a corresponding improvement in inspection and control in order to guarantee a safe milk supply. It is obviously impossible to judge from physical inspection alone whether equipment is producing efficiently pasteurized milk day in and day out.

The introduction of the phosphatase test by Kay and Graham [1] was a long step forward in aiding the supervision of the operating efficiency of pasteurizing plants. But where a large number of samples must be examined, as in routine laboratory or plant work, a relatively simple and rapid method is essential. We have devised a modified phosphatase test which seemingly fills these requirements and, in addition, is relatively inexpensive.[2-5]

Two technics for conducting this test have been developed: an exact laboratory procedure requiring about 1 hour for completion, and a diagnostic short test or "field" test suitable for non-technically trained personnel, which requires about 15 minutes for completion. The field test allows testing at point of sampling, or during plant operation so that irregularities can be detected and the distribution of an improperly pasteurized product prevented. Through use of tablets, preparation of the two necessary reagents is greatly simplified. The two procedures, together with the preparation of suitable inorganic permanent standards, are detailed in the *Standard Methods for the Examination of Dairy Products*.[5]

Because of the simplicity and economy of the two technics, the New York City Department of Health has been able to make more than 150,000 tests (both laboratory and field tests)* in the past 2 years affording a daily cross-section of the city milk

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* The cost of these determinations was less than ½ cent per sample, including all reagents and filter paper, but exclusive of labor.

supply. The Chemical Laboratory has found it possible to make 500 determinations in a single day. Every sample of milk and cream submitted to the laboratories for routine chemical and bacteriological examinations, and all dairy products involved in suspected food poisonings are tested for efficiency of pasteurization. A report is available, when necessary, within a few minutes after receipt of the sample and in the majority of instances, the same day the milk is pasteurized. When irregularities in pasteurization are indicated, an inspection is made at the pasteurizing plant immediately, the cause determined by means of the field test; corrective measures are taken, and samples submitted to the laboratory for confirmation. A product found to be improperly pasteurized is embargoed and released only for manufacturing purposes after repasteurization. As indicated,[6] the rapid field test has a remarkable educational and psychological value. Plant employees and operators are more impressed by a test performed in their presence than they would be by receiving a verbal or written report the next day.

Of the possible causes of improper pasteurization, namely, insufficient holding, insufficient heating, or the inadvertent addition of raw milk, the last cause is the most serious. The generally accepted requirements for pasteurization (143° F. for 30 minutes) present a safety factor above the minimum time-temperature conditions necessary to destroy the common pathogenic organisms found in raw milk. But the addition of even a small percentage of raw milk to a quantity of otherwise pasteurized milk completely destroys the safety factor. Therefore, from the public health viewpoint, the primary task for the phosphatase test is to detect those samples in which there is a likelihood of the addition of small quantities of raw milk or a deficiency in time of heating or temperature of heating sufficient to menace or destroy the safety factor. The problem is complicated by the fact that the improper pasteurization may result from a combination of the above enumerated causes. It is also conceivable that the amount of dilution of the raw milk by a large quantity of pasteurized milk would be so great that the phosphatase test and its modifications thus far proposed would not be able to detect the condition.

Practical considerations govern the limits of sensitivity of any test. The two technics which we have thus far proposed will readily detect the addition of 0.1 per cent raw milk or a drop of 1° in temperature. Where temperatures of pasteurization higher than 143° F. are utilized, the detection of the addition of 0.1 per cent raw milk is more certain, and conversely, where temperatures lower than 143° F. are used, the detection of this small amount of raw milk becomes more difficult because of the residual phosphatase present in the milk at the lower temperatures of heat treatment.

Careful repetition of earlier experiments has indicated that there is no advantage to be gained by the employment of magnesium salts in concentration from .01M to .001M as enzyme catalysts. The sensitivity of both the laboratory test and the field test can be greatly increased by prolonging the period of incubation as illustrated in Table 1.

By means of a 24 hour incubation period it is possible to detect the addition of as little as 0.01 per cent raw milk. However, a 3 hour incubation period should be more than adequate for most purposes, and has in fact been found satisfactory in Europe where higher temperatures of pasteurization prevail. (Personal communications: F. K. Neave, National Institute for Research in Dairying, England; and Pro-

TABLE 1

Effect of Increasing Incubation Period in the Laboratory Test—Results Expressed in Phosphatase Units

	Incubation Period in Hours				Gilcreas-Davis Method
	One	Three	Six	Sixteen	Twenty-four Hours Incubation mg. Phenol per 0.5 cc. Milk
Pasteurized milk control (143° F.—30 minutes)	0	0	1+	3.5+	0.04
" +0.05% raw milk	1	2	5	7.5+	0.04
" +0.10% raw milk	2	3.5	5+	15	0.05
" +0.20% raw milk	2+	5	7.5+	20	0.06–0.09
" +0.50% raw milk	5	7.5+	15+	25	0.09–0.15

fessor Aage Jepson, Royal Veterinary College, Denmark.) For practical considerations, the 1 hour incubation period is still recommended. It should be noted, in passing, that if the butyl alcohol procedure be utilized to extract the developed indophenol from the serum of the laboratory method, the sensitivity is further enhanced. Present investigations to interpret a positive finding of improper pasteurization as due to the addition of raw milk rather than to other factors of operation, are not conclusive.

ACTION OF PRESERVATIVES

Hahn and Tracy [7] have recommended that mercuric chloride be used as a preservative when necessary in samples which are to be examined by the phosphatase test. This was in conflict with our own experiments which had indicated that borax was the only common preservative which could be effectively so employed. Accordingly, we repeated our experiments, utilizing the amounts and preservatives specified by the aforementioned authors. The results are expressed in Table 2, confirming our previous observation regarding the use of borax. A possible explanation of the difference between our results and those of Hahn and Tracy is that they utilized a completely pasteurized milk for their investigation, whereas we employed a milk containing 0.5 per cent raw milk,

TABLE 2

Relation of the Presence of Preservatives to the Accuracy of the Laboratory Phosphatase Test

(Expressed in phosphatase units)

	Time of Storage					
	One Day		Three Days		Five Days	
Preservative Added	Past. Milk	½% Raw	Past. Milk	½% Raw	Past. Milk	½% Raw
None	0	5	0	3.5+	0	3.5+
Mercuric chloride	0	0	0	0	0	0
[illegible]	5 –	7.5	5	5+	3.5	7.5
Borax	0	5	0	3.5+	0	3.5+
[illegible]	0	5	0	3.5	0	3.5
[illegible]	0	2	0	1	0	1

as well as a pasteurized milk. The preservatives were added as follows:

1. Mercuric chloride — 1 tablet to ½ pint of milk
2. Sodium salicylate — 1 gram to ½ pint of milk
3. Borax — 2 grams to ½ pint of milk
4. Hydrogen peroxide — 2 cc. (7.5%) to ½ pint of milk
5. Formaldehyde — 2 cc. to ½ pint of milk

When the field test was employed on the above samples, results similar to the laboratory test were obtained except that initially the hydrogen peroxide treated sample gave low results. The positive result obtained on the pasteurized milk to which the salicylate had been added is due to the fact that the salicylate is a member of the class of phenols which will react with the 2,6 dibromoquinonechloroimide (BQC) resulting in an indophenol blue.

In applying the rapid phosphatase test to goats' milk, it was found that the raw milk yielded only 15 to 50 units. Whether this represents the maximum phosphatase present in goats' milk, or whether a change in the technic of the test, particularly the pH conditions, is necessary, cannot authoritatively be stated at this time. Under present circumstances the addition of even 5 per cent goats' raw milk to goats' pasteurized milk cannot be detected.

Application of this test to high temperature-short time pasteurization of milk has not been adequately studied. From the limited data available, it would appear that heating at 160° F. for 15 seconds yields a negative result on the field test and on the 1 hour laboratory procedure, with a maximum of 5 units for 24 hour incubation.

SOURCES OF ERROR IN THE RAPID PHOSPHATASE TEST

Substrate—Since the disodium phenyl phosphate solution is susceptible to hydrolysis even under refrigeration, with the liberation of phenol, it is strongly urged that as a practical measure this solution be freshly prepared sufficient for immediate needs. The solution can be quickly and conveniently prepared whether reagents or tablets are used.

The 2,6 dibromoquinonechloroimide (BQC) solution is also susceptible to decomposition when not stored under refrigeration or when kept for too long a period even under refrigeration. When the characteristic light yellow color of the alcholic solution changes to brown, the reagent is no longer suitable for use. It may be lacking in sensitivity and thus yield a false negative test, or it may result in a false positive test through the formation of a decomposition product similar in color to the indophenol blue which can be detected in that the butyl alcohol extracted color exhibits dichromatism showing red hues in direct light and blue in reflected light. At times even the powdered or crystalline BQC, through decomposition or fault in manufacturing exhibits this dichromatism. Therefore, we advocate the testing of each new batch of this reagent by conducting the test on a boiled milk sample and a similar sample to which has been added 0.5 per cent of raw milk. The former should show no color, while the latter should not exhibit dichromatism, and should yield approximately 5 units of color.

As a precautionary measure in the laboratory test, we advocate the inclusion of the above mentioned control samples with each day's run. This affords a double check on both reagents and technic. Should the lead acetate solution be permitted to remain in prolonged contact with the milk-substrate mixture before filtration, phenol is pro-

duced for nonspecific reasons. Accordingly, this mixture should be filtered as soon as the proteins and fat coagulate; usually within a minute or two.

Decomposition of reagents during summer temperatures is critically important when using the field test. We cannot too strongly recommend the daily preparation of fresh reagent solutions for this purpose, as well as the thorough cleaning of apparatus, including rubber stoppers, before re-use. Corks should never be substituted for the gum rubber stoppers.

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Incentives and Methods in Health Education—Adult Level The Medical Society View*

RAYMOND H. GREENMAN, F.A.P.H.A.

Executive Secretary of the Medical Society of the County of Monroe, and the Tuberculosis and Health Association of Rochester and Monroe County, Rochester, N. Y.

ACCORDING to Dr. Turner, "Health Education has to do with those systematic, continuing or organized procedures, the primary purpose of which is to improve the health attitudes, behavior, or knowledge of individuals or of groups."

It is generally agreed that everyone should possess certain fundamental information about health preservation and disease prevention.

To this end, following the good example set by the American Medical Association in establishing a Bureau of Health and Public Instruction, and in publishing *Hygeia,* certain state and county medical societies have organized public relations bureaus, have published informative bulletins, books, pamphlets, etc., organized and maintained speakers' bureaus, and sponsored radio programs.

MEDICAL SOCIETY OBJECTIVES

In these activities medical societies have made a constructive effort to overcome the mysteries still surrounding medicine, to discourage self-medication, and to make known good health practices and disease prevention measures.

To aid in obtaining objectives sought, medical societies have found it necessary to keep their members informed not only of society activities, but of the actual information being given to the public by society representatives, public health officials, and others associated in these enterprises, including workers of the local Tuberculosis and Health Association. The medical society monthly bulletin therefore, is of great importance as is the frequent mailing of informative material including that provided by the Tuberculosis and Health Association, the American Heart Association, and the Cancer Society, etc. Education of the profession should precede education of the lay public, and the first responsibility of a medical society is to help doctors to meet a growing demand for them to be more articulate.

PHYSICIANS CAN BE BEST HEALTH TEACHERS

Physicians giving timely instruction to individuals and groups can be the most effective health teachers in any community. The greatest handicap to the effective practice of medicine is the

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delay in seeking medical counsel by patients who do not consult a physician until they are sick—often not until they have been sick for a considerable time.

The successful treatment of many diseases demands a knowledge of the disease process in the patient before that patient feels ill. We should not continue to think in terms of the separateness of preventive or curative efforts to reduce death and disease.

There is no question in my mind but that the criticism of the educational campaign on behalf of periodic health examinations voiced by Dr. Edward S. Godfrey, Jr., Commissioner of Health of the State of New York, is justified. Instead of giving up its promotion, we as health educators should see to it that much more attention is given to medical school and postgraduate medical education dealing with presymptomatic studies of apparently well individuals.

HEALTH DEPARTMENT LEADERSHIP ESSENTIAL

In the development of a community health education program the importance of securing the active participation of influential laymen, as well as physicians, nurses, etc., must be recognized. For leadership, one should be able to turn to the local health department, and for coördination of effort, to a community health council, with a health education division providing for representation from the school, the home, and civic groups in the community. Medical advice needed should be provided by the county medical society representatives on the council.

Outstanding health education programs have been carried on by the Health Departments in Detroit and New York City. Attention should be given to the application of their programs to our local community. The Boston Health Education Survey of 1933 by Dr. Turner is of special interest. Its account of the direct health instruction activities carried on in the waiting rooms of the Boston Dispensary Clinics should be studied by those concerned especially with the education of the clinic patient.

GOOD HEALTH BEHAVIOR NEEDS MOTIVATION

Adults like to consider themselves as very different from children. We like to think of ourselves as logical, reasonable human beings. We have a natural and lively thirst for medical knowledge. We pride ourselves on our knowledge. Then we profess to be shocked when the psychologist tells us that all through life emotions, desires, impulses are more important in directing our actions than intellect and idea.[2]

Dr. Victor Heiser comments frankly, "Reasoning man, claiming free will, with laboratory knowledge at his disposal, remains a slave to dietary habits, sacrificing his health and even sometimes his life largely because life is a tissue of habits." "We are surrounded by custom," continues Dr. Heiser, "and we cling to what is familiar."

Our message, to be successful in obtaining a desired result, must, we are told, arouse curiosity, enlist sympathy, and impart information which leads to action. It must be able to stand the test of discussion and deliberation. It must have something to do with our daily living. It must be simple. It must be interesting.[3]

ATTITUDE MOST IMPORTANT

You cannot scare people into taking worth while health measures, but you can convince them of the need for following those procedures which will make them effective, and help others as well as themselves.[4] Most important is our attitude. When that is favorable we are open to conviction. The reasons why action should be taken must be carefully explained. Dr. Alexis Carrel states, "it is impossible to manage one's

life properly without some knowledge of the ways of the human body. In order to conserve health we must have the will to know and the will to act. "Health," concludes Dr. Carrel, "is largely due to the excellence of adaptation." First we must know our own physical assets and liabilities.

PERIODIC HEALTH EXAMINATION VALUABLE

We unqualifiedly recommend as the keystone of an individual health program a periodic health examination. We recognize the value of seeking a doctor's counsel frequently. We believe that everyone should follow a definite set of rules for living to the limit of his capacities. Those of us who are parents will, if we practise what we preach, encourage in our children an inquiring state of mind. We will emphasize the value of good health habits. We will be thankful that school health education services are influencing our children to follow good health practices because they have been proved to be effective.[5]

We who are in health education work, however, cannot limit our activity to advocating certain procedures and correcting misinformation. We must constantly recognize the necessity of popular acceptance of sound campaign objectives.

The contribution of predominantly lay groups in the removal of a social sanction of shame concerning discussion of syphilis is noteworthy. Now that syphilis is known as a communicable disease, rather than a disgrace, and now that the public is willing to talk about gonorrhea as well as syphilis, we must get the public to consider gonococcal infection as deserving of special attention.

CAMPAIGNS STIMULATE ACTION

We must give careful consideration to our participation in nationally organized campaigns.

We find on our calendar—National Social Hygiene Day, Child Health Day, Mother's Day, Tuberculosis Sunday, Cancer Week, and Hard of Hearing Week. Certainly a local health education worker has a responsibility to see to it that his community participates effectively in recognized nation-wide health promotion and disease prevention campaigns.

PUBLICITY PAVES THE WAY

In appraising the various methods of health education, it can be said that publicity paves the way. The press aids in health education. Newspaper stories attract attention and are especially valuable at the time of initiating a project. News space, however, is very limited. News must be reported in positive categorical statements. The disinclination to publish carefully prepared news releases containing committee statements is widespread. The practice of physicians of carefully qualifying health information has led to a practice on the part of the press to turn to the health officer as spokesman for the medical profession, as well as the health department. This places on him an added responsibility, particularly affecting public attitudes on health subjects.

WEEKLY RADIO TALKS EFFECTIVE

The county medical society health education program usually has a weekly radio broadcast as its principal contact with the public. In this program recognition can be given to nation-wide observances in the year's special emphasis periods.

In the weekly radio broadcast, the county society finds the ideal method of presenting "the kind of information your family physician desires you to have, expressed by the voice of a physician you know." While no radio program can stand alone, yet through the maintenance of a regular broadcasting

period, with advance publicity on the subject to be discussed, it is possible to build up a large and responsive audience. Dr. Bauer of the American Medical Association emphasizes the need for repetition of the vital message.

"Every talk," states Dr. Bauer, "should have three constituents: a smile, a tear, and an idea; a bit of humor and a bit of human interest, perhaps of a pathetic character, help to humanize the talk so that it becomes something more than a dry recitation of facts which may be important but not in themselves particularly interesting. The best radio voices are natural. The radio speaker must speak distinctly and slowly enough so that a listener has time to get the meaning of what is being said." [6]

PUBLIC MEETING BEST METHOD

Motion pictures, the radio, newspapers, and exhibits are of distinct value and carry their message to large numbers of people. However, their effect is often but transient, being diluted by a medley of wholly unrelated ideas. The well organized, properly publicized public meeting is, in our opinion, the best means of imparting solid public health information to adults.[7]

MOTION PICTURES AND EXHIBITS ILLUSTRATE MESSAGE

The public is picture minded. A window display is a combination of a poster, a newspaper advertisement, a stage set, and a speech. An exhibit presents an opportunity for a visual discussion of the subject. The use of color is important. Red and blue are best and give weight to your message. People are more interested in other people than in pictures of objects or views of scenes. Dioramas are being used most effectively even though they are rather expensive to construct.

There are those who believe that the mental impression of a lantern slide, good diagram, or wall pictures, well demonstrated, is more lasting than that of a motion picture. Many prefer the voice of a teacher to a "talkie." A chalk talk well given is a most effective teaching medium. There are available new sound motion pictures on tuberculosis, pneumonia, cancer, smallpox vaccination, diabetes control, maternal welfare, and heart disease. A new syphilis control motion picture is being made which can dramatically supplement the speaker and aid in the arousing to action of an audience. These have entertainment as well as educational value.

The New York World's Fair has again demonstrated the pulling force of human curiosity and the interest of the public in many of those subjects previously wrapped up by physicians in a mystic mantle of medical reserve.[8]

That people are willing to have their knowledge tested, and that the results are of interest to everyone is evident by the success of the Quiz Corner at the Fair.[9] That they are interested in their state of health is indicated by the large number of persons who sought a chest x-ray in the demonstration unit sponsored by the Queen's County Medical Society. In spite of our efforts as health educators there is no doubt that there is confusion in the minds of many people as to what *they* should do about tuberculosis or cancer, for example. According to findings reported in recent Gallup polls, many gave a wrong answer to questions asked and had confidence in the correctness of the information they possessed.

LEAFLETS GIVEN ON REQUEST

No longer is the distribution of leaflets conducted on a wholesale basis. It is the prevailing present practice to distribute literature only on request. We may say from our own experience, that contrary to the story of fifteen years ago we, as health educators, are now engaged in meeting a demand for in-

formation rather than in the promotion of certain good slogans.

The physician has come to turn to the health department for help in supplying the demand for new information. Now that health departments have ceased to publicize clinics and have aided the physician by providing needed drugs for treatment, physicians are increasingly turning to the health officer as their best friend.

Having endeavored very briefly to emphasize incentives which lead to action, and methods which get results, I want to call attention for just a moment to the woeful inadequacy of health department provision for health education service.

HEALTH EDUCATION BUDGET ALLOWANCE INADEQUATE

The government of the State of New York, through its Health Department, spent approximately $80,000.00 or 12½ per cent of its total budget last year for its health education service.

With this relatively small budget, the Division of Public Health Education was called to meet the health education needs of more than 6½ million people in upstate New York—an obvious impossibility—yet the proportionate assignment to health education is larger than in any other health department in the country.

PUBLIC SUFFERS BECAUSE OF IGNORANCE

The public still suffers because of ignorance. This can be overcome to a great extent by increased educational activity. The health education possibilities in a health department service are greater today than ever before. They cannot be delegated to the organized medical profession and the voluntary health association which have shown the way to get results. Physicians are prepared to continue to help in meeting the lag between the acquirement of scientific knowledge and an informed public.

SUMMARY OF CONCLUSIONS

1. The periodic health examination is the keystone of a health education program for an individual.
2. Attitude and good health behavior need motivation.
3. Health departments should employ health education directors, develop health education projects, and give needed leadership.
4. Every large community should have a health education council with medical advisers, provided by the county medical society, it being recognized that physicians can be the best health teachers.
5. Every community should list its health education facilities and enlist widespread medical and lay participation.
6. County medical societies should provide medically accurate information and maintain a speaker's bureau and information service.
7. County society weekly radio programs on regular schedule are a most important educational project.
8. Public meetings on health subjects can be very effective, and should be held regularly in addition to nation-wide campaigns which stimulate specific action.
9. Printed matter supplements the spoken word, and exhibits illustrate a single health message. Motion pictures are valuable adjuncts. Leaflets should be given only on request.
10. Health education of adults is as worth while as the health education of school children and is just as productive of results, but its development has not been fully realized.

There is great need for the dissemination to professional groups and to the public of the large store of knowledge on the prevention of disease and the conservation of life which is being accumulated by scientific men. It should be presented in a way which will appeal to men and women and will help them in their individual lives, and result in community good.

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Louis Livingston Seaman Fund

THE New York Academy of Medicine announces the availability of the Louis Livingston Seaman Fund for the furtherance of research in bacteriology and sanitary science. Fifteen hundred dollars may be awarded for assignment in 1940. This fund was established by the will of the late Dr. Louis Livingston Seaman and is administered by a committee of the academy which will receive applications from either institutions or individuals up to October 15. Communications should be addressed to: Dr. Wilson G. Smillie, Chairman, 2 East 103rd Street, New York, N. Y. The fund will be expended only in grants for research in bacteriology or sanitary science.

Diet and Resistance to Infection

III. Genetic Versus Dietary Factors

CHARLES F. CHURCH, M.D., F.A.P.H.A., AND CLAIRE FOSTER

Department of Pediatrics, School of Medicine, University of Pennsylvania, and The Children's Hospital of Philadelphia, Philadelphia, Pa.

IN our earlier publications[1, 2, 3] we reported certain experiments which we interpreted as evidence of influence of maternal diet upon the resistance of the offspring to infection following inoculation with *Salmonella enteritidis*. The comparisons were limited to the descendents of the D line (unselected Swiss) mice. For many previous generations this line had been maintained in the stock of Dr. L. T. Webster at the Rockefeller Institute for Medical Research on Diet A, a diet of bread and milk, supplemented twice a week with a mixture of oats and buckwheat, and once a week with dog biscuit.

On their arrival in our laboratory, all the mice were placed on a modified Steenbock diet of ten ingredients, Diet C (200). After an interval of 2 months, 4 females and 2 males which had been taken at the same time from the same breeding pen at the Rockefeller Institute, were divided into two breeding lots: females 1 and 3 with a male constituted one lot; females 2 and 4 with a male constituted the second lot. The first lot was continued on diet C (200). The second lot was

TABLE 1

Composition of Diets

A—Bread and milk supplemented twice a week with a mixture of oats and buckwheat and once a week with dog biscuit.

B—221

	Parts
Ground whole wheat	66.0
Powdered whole milk	33.0
Sodium chloride	1.0

C—200

	Parts
Whole ground corn	64.0
Linseed oil meal	16.0
Crude casein	5.0
Wheat germ meal	10.0
Powdered whole milk	5.0
Brewer's yeast	2.0
Ground alfalfa	2.0
Sodium chloride	0.5
Calcium carbonate	0.5
Cod liver oil	1.73

D—212

	Parts
Extracted casein	20.0
Sucrose	76.0
Brewer's yeast	10.0
Salt mixture	4.0
Lard	2.0
Cod liver oil	2.0
Wheat germ oil	0.3

E—214—Diet 212 with part of the brewer's yeast autoclaved.

Elementary Composition per 100 Calories

	Calories from			Milligrams					
Diet	*Pro.*	*Carb.*	*Fat*	*Ca*	*Mg*	*K*	*Na*	*P*	*Cl*
200	16	68	16	118	19	152	62	90	98
212	19	72	9	149	18	270	43	145	52
221	16	59	25	105	13	199	136	139	232

placed on a Sherman diet of three ingredients, Diet B (221), analogous to the ancestral diet of bread and milk. The composition of these diets is shown in Table 1.

The offspring were segregated, and the selected breeders were sibling-mated. Thus, 4 lines of mice were developed, from the 4 females 1, 2, 3, and 4, and the lines were continued after the first generation by sibling mating, or in a few rare instances, by cousin mating. After the initial changes already mentioned, the diet of each line and its several branches either remained uniform or was changed as indicated in Table 2. About once a month, the offspring of similar age (approximately 6 weeks) from each line and its various branches, were placed on the same experimental diet. Two weeks later they were inoculated with *Salmonella enteritidis* and the percentage survival of each group of mice was tabulated in relation to its ancestral dietary history. It must be observed that a different ancestral dietary history in most instances connoted a different genealogy. Throughout a series of experiments, mice whose ancestors had been kept for several generations on diet C (200), mostly descendents of females 3 and 4, had a percentile survival in inoculation experiments which we have reported [1, 2, 3] as from 43 to 79 per cent; mice whose ancestors had been kept for several generations on diet B (221), most of these being descendents of mouse 2, had a percentile survival which we have reported [1, 2, 3] as from 7.8 to 12.1 per cent. The difference between the two groups had high statistical significance.

In one of our earlier publications [3] we made the following comment:

> These differences in the host resistance of young mice from the two maternal diets appear to be the result of differences in the nutrition of the mother. The possibility of variation in the genetic constitution of D line mice as a result of heterozygous matings cannot as yet be ruled out absolutely, since strict sibling mating has been practised for only eight generations. However, in view of the consistency of the survival responses of progenies from the two maternal diets, this possibility appears remote.

Sibling mating through successive generations gives the greatest likelihood of genetic uniformity in any given litter. On the other hand, sibling mating tends to preserve and perhaps accentuate through successive generations any genetic difference between ancestors at any point in the line of descent.

The genealogical descent of the mice kept through successive generations on the diet of three ingredients, diet B (221), with low survival of inoculated offspring, and of the mice kept through successive generations on the diet of ten ingredients, diet C (200), with high survival of inoculated offspring, is shown in Table 2.

Our earlier publications were based on inoculations up to number 125. Continuation of our observations has led us to recognize the possibility of greater importance in the genetic background and less in the ancestral diet than we inferred at the time of these publications. We call attention to the following examples:

In the small group of inoculated descendents of mouse 1 there is no significant difference whether the last ancestral diet was diet C or diet B. At the bottom of the tabulation of descendents of mouse 2 it will be noted that more than 50 weeks of maintenance of mothers, or even also of grandmothers, on diet C, induced no improvement in the survival of the offspring. Conversely, at the bottom of the tabulation of descendents of mice 3 and 4, it will be seen that maintenance through one or two generations on diet B did not reduce the survival percentage of the offspring.

TABLE 2

Genealogy, Ancestral Diet and Survival of Offspring after Inoculation

1	2	3	4	5	6
Genealogy of Mother	*Ancestral Diet*	*Weeks on Last Diet ±1 Week*	*Inoc. Exp. No.*	*No. Inoc.*	*No. Surv.*
102	ACDC.C	51	110	2	1
1022	"	75	116	3	1
10223	"	107	121	2	1
				7	3
141	ACDC.B	7	110	1	1
141	"	15	112	2	0
141	"	31	116	2	1
1411	ACDCB.B	30	116	4	0
1411	"	39	118	3	0
				12	2
23	ACB.B	80	110	6	0
23	"	88	112	5	1
23	"	104	116	6	1
23	"	112	118	10	0
233	"	104	116	8	0
2331	"	152	125	4	1
2331+	"	205	134	11	0
2331++	"	209	135	21	5
2331++	"	221	137	25	0
231	"	113	118	7	0
231	"	129	119	41	5
231+	"	136	121	20	2
231+	"	144	123	20	0
231+	"	152	125	16	1
				200	16
231	ACB.C	7	127	17	1
2317	ACBC.C	51	134	2	0
23173	"	67	137	7	0
				26	1
3213	ACDEC.C	59	112	8	3
321++	"	68	116	11	3
321+++	"	83	118	13	9
321+++	"	99	119	20	3
32113+	"	107	121	11	2
3211+++	"	135	129	10	9
32113++++	"	163	131	16	7
32113++++	"	171	133	10	5
321133144	"	179	135	9	5
32113++++	"	179	136	9	4
				117	50

1	2	3	4	5	6
Genealogy of Mother	*Ancestral Diet*	*Weeks on Last Diet ±1 Week*	*Inoc. Exp. No.*	*No. Inoc.*	*No. Surv.*
321111	ACDEC.B	15	129	8	6
32113312	"	7	129	6	3
32113312+	"	40	132	14	6
321133122	"	47	134	13	8
321133124	"	51	135	5	2
				46	25
41	ACBC.B	7	110	6	1
43	ACBC.C	20	110	6	4
43	"	28	112	5	1
43	"	44	116	6	3
43	"	52	118	7	4
4311	"	40	125	8	5
431+	"	104	129	13	10
4312+	"	144	134	15	4
43121	"	162	137	6	2
431221	"	150	136	3	2
433	"	76	121	7	4
433	"	84	123	11	5
433	"	92	125	12	6
4331+	"	144	134	14	11
43316	"	161	137	12	12
				131	74
4333	ACBC.B	7	127	15	8
43311	"	7	132	12	11
43311	"	8	134	7	6
4333+	ACBCB.B	55	135	7	6
				41	31

Column 1 — describes the ancestry of the offspring for inoculation. Each digit, beginning at the left of the number, identifies the mother of the succeeding generation. An identical succession of digits therefore indicates identical ancestry up to that point. A + sign indicates that descendents from two or more sisters are combined in the offspring inoculated.

Column 2 — the letters to the left of the period indicate the consecutive diet changes in the ancestry of the mother; the letters to the right of the period indicate the maternal diet prior to the weaning of the mice which were subsequently inoculated.

Column 3 — indicates the number of weeks the last diet was in effect in the ancestral history of the inoculated mice.

In view of these facts, we are forced to conclude that it should be considered as yet an open question as to whether the striking difference we reported [1, 2, 3] in the susceptibility to inoculation with *Salmonella enteritidis* in mice whose ancestors had been kept on diet C (200) or diet B (221) respectively, was necessarily the result of the dietary factor, or whether some

genetic difference may have existed perchance between the original ancestors 1, 2, 3, 4, a difference preserved through successive generations by the practice of sibling mating.

Continuation of this study by one of us (C. F.) is directed toward testing these alternative hypotheses by substituting crossed mating for sibling mating. Crossed mating will tend to distribute the genetic characteristics evenly among the groups of mice used to study the maternal diets with respect to their effect on the disease resistance of their progeny. To this end, a single litter composed of 3 males and 3 females, whose older brothers and sisters had shown approximately 50 per cent survival when inoculated with *Salmonella enteritidis,* has been selected as the parent generation for the new set-up. The female progeny of each litter which are to be used as breeders in the succeeding generations will be divided so that part of them are kept on their ancestral diet B (221) and part are changed to diet C (200). Females kept through successive generations on one diet will be mated with brothers of females kept through successive generations on the other diet, and vice versa. Any genetic differences between the two groups should thus be progressively equalized, yet the long continued influence of the same diet operating through the females of successive generations by way of pregnancy and lactation should be demonstrable.

SUMMARY

The importance of the genetic factor in influencing the survival of mice following inoculation with *Salmonella enteritidis* is reaffirmed. The importance of the maternal diet, on the other hand, is still an open question which requires further study with a different genetic technic from that which we have thus far recorded.

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Civil Service in Public Health*

CHARLES F. BLANKENSHIP, M.D.
Passed Assistant Surgeon, Domestic Quarantine Division, U. S. Public Health Service, San Francisco, Calif.

A PERSON is most commonly asked to speak at a public meeting for the reason that he is an authority on some subject. I wish that I had the distinction of authority, but I have not.

My appearance here is due to my having been actively exposed to the intricacies of merit systems of personnel administration. My special assignments as a professional health worker have happened to lead me into most of the formal and many of the informal discussions of the merit system for health workers in Washington.

The administrative aspects of personnel management should of course be discussed by those familiar with the technics involved and must, in all cases, be examined by the light of local laws, administrative practices, and concepts of government. These few remarks are not addressed to the administrators of the several departments as such but rather to the individual health worker. I shall try to shape my remarks around what the merit system will mean to him and what he should do about it.

For the purposes of this paper, the terms " civil service," " merit system," and " career service " will be used interchangeably. They will denote a system of personnel management in official health departments under which the selection of personnel and related matters are based on considerations of merit and are determined by objective procedures. While the terms are subject to technical differentiation, it will not be done at this time.

Last year an amendment made to certain titles of the Federal Social Security Act focused the interest of all workers in official health agencies upon merit systems of personnel administration. The amendment as applied to Title V provided that after January 1, 1940, state and local plans for maternal and child health and for crippled children services must include methods relating to the establishment and maintenance of merit systems of personnel administration.

Following a conference with the State and Territorial Health Officers, the U. S. Public Health Service broadened its Regulations Governing Allotments and Payments to States under Title VI of the Social Security Act so as to incorporate provisions with respect to a merit system. The regulations now provide that in order to be eligible to receive funds under Title VI of the Social Security Act, states must submit to the Surgeon General any merit system plan developed to cover any part of the health personnel. Any such plan for a merit system found acceptable shall apply to all personnel engaged in the federal state coöperative health program.

Inasmuch as many health departments receive some federal grants-in-aid

* Read before the Western Branch American Public Health Association at the Eleventh Annual Meeting in Denver, Colo., June 27, 1940.

funds, the provisions in respect to merit systems attached to these funds affect a high proportion of state and local health workers. Their interest in the whole scheme should therefore be assured.

Many persons think of civil service or a merit system as a procedure designed only to prevent the selection of personnel on the basis of political considerations. They think the only reason for the existence of civil service is to circumvent consequences implied by the expression "to the victor belong the spoils."

A merit system should accomplish this purpose; but to be successful, it must go still further. It must of course eliminate from the selection process all types of politics, whether partisan, personal, fraternal, racial, religious, professional, labor, or school. At the same time it must provide that qualified persons are selected for positions and that the eligibility lists are made up of the best qualified.

If it were necessary only to obtain qualified personnel, without regard to the degree of qualification, the most economical and impartial procedure could be a simple one based on the laws of probability; in other words, a random selection from those having the required minimum qualifications. A lottery might do, or a bingo game, or some modification of the numbers racket.

Some opposition has been expressed to the formalization of the selection process by the adoption of standards, rules, and regulations. Well intentioned critics say in effect that on the whole health personnel have been selected on the basis of merit for many years; that politics has not played a large part in the choice of health workers—at least for the more responsible, professional positions; and, because of this, that the adoption of standardized procedures is both unnecessary and uneconomical.

If all health departments were relatively free of partisan politics, and if merit systems had no purposes other than the selection of the best qualified, that objection might be valid. But those premises are not necessarily true. Unfortunately, some health personnel are still selected almost entirely on the basis of political connections, and, as a result, the quality of health work done is often poor. The adoption of a sound merit system will do much to obviate such conditions.

Also, the use of merit systems has several beneficial results other than the selection of the best qualified to serve in governmental agencies. One of the most important of these is that such a system will gain public recognition because of the high professional standards attained. Fortunately, we in health work have developed staffs better trained and qualified for their jobs than are the staffs of many other branches of government. Public acceptance of our leadership, and confidence in our work can still be greatly enhanced when these high professional standards are more widely recognized. This should result in salaries more in keeping with the requirements of the job than is the case at present. I am sure all of us favor such a result.

Still another circumstance which may be expected from the adoption and proper administration of a sound merit system is greater security and longer tenure of office than are offered at present to those individuals who are performing their work in a satisfactory manner. Such a result is important to all professional public health workers. It is unreasonable to expect even the most competent individual to perform satisfactorily when his likelihood of continued employment hangs by the thin thread of personal favor; this, as most of you know, may be severed at a moment's notice.

By no means do I intend to imply that a merit system should make a

sinecure of each position in the health department. Nothing could be worse than a system of personnel management which would prevent the dismissal of employees for misconduct or gross incompetence. But the merit systems now being developed can, and with your help will, prevent the dismissal of a competent employee solely because he has earned the personal animosity of someone in a supervisory capacity.

My last topic is the provision of opportunity for professional growth and for promotion or demotion, as the case may warrant, on the basis of performance. Herein lies the greatest opportunity for improving personnel relationships and the quality of work performed in public health departments.

Despite the fact that the performance of health departments in general is excellent with regard to selection of personnel, their records in assurance for professional growth and maintenance of status for competent workers have been rather poor. The opportunity now exists for developing a real career service for health workers. With proper administration of soundly conceived merit systems, it should no longer be necessary for the health worker to look forward to a life of insecure employment, and often without promotion.

Four general statements with regard to merit systems should be made in closing:

First, whether or not one favors the extension of civil service into all health departments, it is actually taking place and it is of personal consequence to each health worker.

Second, since every health worker practically is involved, it should follow that health workers will interest themselves in the plans for their jurisdictions—those now in effect or those being developed.

Third, the approval of a state merit system plan by a federal agency constitutes no continuing guarantee that it will be satisfactory in operation to either the state administrator or the individual worker covered by the plan.

Fourth, the success of a merit system will depend to a great extent on the recognition that personnel management is a specialty in public administration, and on the assignment of this duty to individuals properly qualified for it by experience or training.

Industrial Nursing*

Supplementary Report of the Study Committee on Industrial Nursing on Five Small Industries in Philadelphia County

RUTH W. HUBBARD, R.N., F.A.P.H.A.
General Director, Visiting Nurse Society of Philadelphia, Philadelphia, Pa.

THIS report, which forms a brief supplement to the admirable and stimulating survey reported by Miss Stevens,[1] is concerned with the nursing service in five small plants in Philadelphia. While much of the lack of uniformity which has been presented to you exists here also, some is obviated by the fact that one physician serves 4 of the 5 plants, and one nursing agency—the Visiting Nurse Society—supplies all the nursing service. The variables are found in the number of employees per hour of medical and nursing time; the accident load in terms of plant activity and population; and the attitude of management toward health promotional as well as corrective services.

To follow the development of the main report, I can begin by saying the general policies of nursing practice in these plants were first set by the original sponsoring agency, the Philadelphia Health Council and Tuberculosis Association, in 1926. When the Visiting Nurse Society assumed responsibility for the nursing program in these plants in 1932, certain things were already established. The nurse, paid on an hourly basis, was employed 2 hours per week per 100 employees. The program provided for assistance of the physician in annual physical examination of all employees, care and follow-up in the plant of accidents and illnesses, and the promotion of employee health by very general health supervision and individual instruction. Individual records were kept.

The plants now range in size from 100 to 570 employees. All but one, a lithographing company, are food preparation plants. The employees in these plants total approximately 1,600 and are scheduled to receive 50 hours of nursing service weekly. Three hours is the smallest amount given any plant in a week, but this is not the plant having the lowest number of employees. However, the largest plant does have the greatest amount of service—23 hours. Long ago it became clear that the accident rate in a plant was influenced by the kind of activity. Therefore, the old standard of 2 hours of nursing per week for each 100 workers has been relinquished and time is now purchased on demonstrated need.

In all 5 plants the nurse has responsibility with the physician for plant inspection and individual health instruction. There are no classes. A planned use of posters in strategic spots represents the chief effort at group health education. In no plant is the nurse a member of the Safety Committee.

None of the programs provide for nursing service in the home, but the use

* Read before the Public Health Nursing Section of the American Public Health Association at the Sixty-eighth Annual Meeting in Pittsburgh, Pa., October 18, 1939.

of the Visiting Nurse Society by the plant physicians and nurses is showing a steady increase. At the time that the society embarked upon this piece of work, each of the 5 plants had a satisfactory relationship with at least one neighboring hospital for referral of emergency accidents or illnesses. These resources are used constantly. More recently the use of local health and social resources by these plants has increased appreciably, and the plant physicians give credit to the nurses for this activity. It is natural for a public health nurse familiar with her community to use its resources for industrial patients as she would for others. The tendency to work as an isolated unit mentioned in the main report was very apparent in the industries in question 7 years ago.

The programs for employees vary greatly within the plants. Two now follow the policy of preëmployment physical examinations. In one of these the examination includes a Wassermann test. In the remaining 3 plants examinations take place as soon as possible following employment. In all the plants blood tests are made upon request, and, when necessary, treatment is arranged through the private physician or a hospital clinic. In 2 plants the health promotion program has included the voluntary use of cold vaccine for susceptible employees. Two plants have loan funds, established by management, to facilitate correction of defects.

The nursing procedures have been reasonably well standardized. Such variations as occur are present because of local needs. Each plant has written standing medical orders, nursing policies, and procedures. These have been worked out jointly by the group involved.

The qualifications of the nurses are those for staff appointment to the Visiting Nurse Society plus successful experience within the society. Early in its participation in industrial work, the society became convinced that a supervisor acting as a liaison person between the industry, the medical director, and the nursing agency, was imperative. For the past 5 years an assistant supervisor has carried this responsibility, introducing new staff members to the plant, providing for continuous education of the industrial nurses, and working out the problems of an experimental program. To her effort is due much of the standardization suggested above.

The Visiting Nurse Society is a member of the National Safety Council and uses its material constantly. Attendance at national meetings in this field has also become an organization policy.

In conclusion, we agree thoroughly with the committee report concerning the problems confronting nursing in industry. We are equally in accord with the opinion that industry is ready for nursing activity. Our experience leads us to believe that industry and industrial physicians are desirous of good nursing service for their workers. It is our conviction that the public health nurse can be a valuable person in the small plant, and can carry such activity in conjunction with her district work successfully. Since the public health nurse on an agency staff is primarily a part-time worker, she cannot of course fill the need of the plant which requires full-time service.

American Journal of Public Health
and THE NATION'S HEALTH
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Volume 30 October, 1940 Number 10

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HANS ZINSSER, M.D.

THE death of Dr. Hans Zinsser on September 4, brought to a close the activities of a man who won for himself an enviable position in the medical profession, and particularly in that branch of which he had made a specialty—Bacteriology. Dr. Zinsser was born in New York City in 1878, of German parentage. He was educated in the schools of that city, took his A.B. degree from Columbia University in 1899, and his medical degree from the College of Physicians and Surgeons (Columbia University) in 1903. His internship was taken at the Roosevelt Hospital in 1903–1905. He was Assistant Bacteriologist at his Alma Mater in 1905 and 1906, and Instructor in Bacteriology and Hygiene from 1907 to 1910. In 1910 he became Associate Professor of Bacteriology at Stanford University, and Professor at the same institution from 1911 to 1913, when he returned to Columbia University as Professor of Bacteriology, where he served for 10 years. In 1923 he became Professor of Bacteriology and Immunology at Harvard Medical School, which position he held at the time of his death.

He was active in many lines, but always seemed particularly interested in the question of immunity. The World War of 1914–1917 stirred him mightily—as he says, partly from temperament and partly through the hope that a defeated Germany might be transformed into the free republican state for which many Germans of his stock had hoped. His opportunity came when he was appointed on the American Red Cross Typhus Commission to Serbia, in 1915, which was "his first experience of mass misery." It had a further effect, however, of arousing his interest in this dread disease, an interest which never flagged, so much so that his last scientific work, announced in January, 1940, was devoted to the development of a vaccine for the mass protection of people against the European type of the disease, on which he had worked for a number of years.

In 1917, when America entered the War, Dr. Zinsser was appointed Major in the Medical Corps of the U. S. Army, and was finally promoted to the rank of Colonel. He served as Sanitary Inspector of the First Army Corps, and the Second Field Army of the A.E.F., also Assistant Director of Laboratories and Infectious Diseases for the A.E.F. In the summer of 1923, he went to Soviet

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raw state, only 24 of them cooking it before consumption, and some of these cooking only a portion. Twenty-two of these cities maintained hog farms for the purpose of disposing of garbage, either to derive revenue therefrom or to avoid the expense of disposal. While no reliable statistics are available, there is reason to believe that smaller communities employ this method of garbage disposal even more frequently than the larger cities.

It seems that our American cities are, directly or indirectly, the largest feeders of raw garbage to swine, and Wright says that, contrary to the general opinion, hogs fed on uncooked garbage are probably the major source of human trichinosis rather than rats. A feature that to a great extent conceals the evil of this practice is that many hogs which have been fed on raw garbage are slaughtered locally, and there seems to be a distinct purpose on the part of garbage feeders to avoid marketing in federally inspected packing plants due to the desire to escape the losses of condemnation under federal inspection.

The distribution of raw garbage feeding is important and interesting. In New England, of 141 cities, 85.2 per cent fed garbage. Next came the Mountain and Pacific States, in which respectively 78.9 and 82.8 per cent disposed of their garbage in this way.

The areas in which the most hogs are fed garbage are those in which the largest number of cases of trichinosis are found. The Pacific Coast States, in which 82.8 per cent of the cities dispose of garbage by feeding, have the highest morbidity rate of any section. The New England States, which come next, lead all other geographical areas in the number of cities disposing of garbage by feeding to hogs. It does not seem to require much argument to convince one that there is a distinct relation between the amount of trichinosis in human beings and the extent of feeding raw garbage to hogs in the communities in which the disease is prevalent.

None of these fundamental facts are new. This *Journal* has repeatedly called attention to the risks of feeding raw garbage to hogs. Many of the cities which indulge in this bad practice have adequate food inspection, good milk ordinances, pure water supplies and satisfactory sewerage systems. In other words, these municipalities have provided protection against most of the diseases spread through food and drink, but have failed to guard their citizens against trichinosis. Indeed we might say that they are fostering the disease.

The reasons for this situation are apparently almost entirely commercial. Some cities are themselves directly to blame since they maintain hog farms of their own. In others pressure has been brought to bear against the passage of ordinances designed to protect the citizens against the menace of raw garbage fed pork. In at least two states legislation to control the feeding of raw garbage to swine has been blocked by organizations of those engaged in the business. If, as Wright holds and we believe, the hog is the chief source of human trichinosis, little can be accomplished in the way of control until cities and towns refuse to dispose of their garbage in this unsanitary and disease-spreading fashion.

Here is the job for health officers.

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TULAREMIA

TULAREMIA, known also as "rabbit fever" is not only being more often recognized than formerly, but appears to be actually increasing in prevalence. Described first in 1910, by McCoy, of the Public Health Service, while working on plague in California, as a "plague-like" disease among ground squirrels in Tulare County, it was subsequently intensively studied by Edward Francis of the same Service, who showed its identity with the "deer fly fever" of Utah, and gave the name "tularemia."

In 1939, 2,200 cases were reported, with probably 150 deaths. It has been observed in all of our 48 states and in the District of Columbia, and since 1925 it has been recognized in 10 foreign countries.[1]

Over 90 per cent of the human cases in this country are caused by direct infection in handling wild rabbits and hares, hence we find the disease particularly prevalent in market men, hunters, housewives, and those who dress rabbits for the market. However, human cases have arisen through infection from 24 forms of American wild life, including horseflies, wood ticks, dog ticks, insects, tree squirrels, opossums, ground hogs, muskrats, skunks, and very rarely a few others. However, the wild rabbit of the country is the main source of the disease, which is usually acquired by handling the carcasses, but in 20 cases from eating the animal insufficiently cooked. Among these 20 cases, there were 12 fatalities.

Another report [2] told of the discovery of the *Bacterium tularense* in the water of three streams in Montana, which indicates another possible source of infection, and this confirms an observation reported from Russia in 1935 of an epidemic of 43 cases due to drinking the water from a brook believed to have been contaminated by water rats. The discovery of the *Bacterium tularense* in water in Montana was incidental to an investigation of epizoötic tularemia in beavers.

From what has been said, it is evident that prevention consists largely in protecting the hands and the body when dressing wild game, especially rabbits. Francis long ago warned hunters particularly against handling a rabbit that was not active and lively, especially one that could be killed with a stick, as such rabbits are apt to be infected. Those whose work requires handling of rabbits should wear rubber gloves, but it is better still for those who are not immune to avoid such employment, since one attack protects against subsequent infection. Careful washing with soap and water, followed by disinfection, is recommended, after handling infected flesh as well as after touching the fur of wild rabbits or other game, especially when killed in regions known to be infested. Thorough cooking makes infected meat safe. Refrigeration does not kill the organism, unless prolonged.

In spite of some claims to the contrary, there is no specific preventive or curative treatment for the disease. Convalescence is slow. Weakness and disability may persist for 2 to 3 months. The mortality is about 5 per cent, mostly from the supervention of pneumonia.

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Credit Lines

A Digest of Diversified Health Interests

D. B. Armstrong, M.D., and John Lentz, M.S.

In Behalf of the Good Neighbor Policy

The need for a comprehensive manual covering all important aspects of hospital administration in this country has frequently been voiced by Latin-American physicians and health authorities. Thus it comes as good news to learn that *The Modern Hospital*, a journal published primarily for hospital administrators, has published a reference book designed wholly for use in the Central and South American countries. This book is written in Spanish and bears the title "El Libro del Hospital Moderno" (The Book of the Modern Hospital). Latin-American hospitals, clinics, medical schools, and health agencies will receive the book free of charge. We view this as a most laudable undertaking that may help to strengthen the ties of Pan-Americanism.

The book contains 34 articles prepared by recognized physicians and hospital authorities. These articles summarize a large body of material on hospital practices in this country. There are sections on hospital philosophy, planning and construction, administration, clinical services, and international coöperation. The text is supplemented by helpful illustrations and floor plans.

We applaud the publication of this manual. It arouses in us hope that the public health profession will also soon demonstrate that it is alert to the need for the development of closer relations within this hemisphere. The American Medical Association has already taken a step in this direction by inviting Latin-American physicians to their 1941 convention. It is our belief that an exchange of cultural and scientific material will be an important factor in bringing the Americas closer together.

Coming Attractions

Seldom has the roster of forthcoming health motion pictures been so extensive. Among the agencies announcing new films is the Metropolitan Life Insurance Company which, with the coöperation of the U. S. Public Health Service, is preparing a one reel production on a subject that is of interest to all health and welfare agencies—nutrition. The film will be made by Paramount Pictures and will be designed primarily for theatrical exhibition. Of especial interest is the fact that this film will be photographed in Technicolor. No release date has been set, but the film will probably be ready for showing early in December. By means of a series of dramatic episodes, the film will show the vital rôle that proper nutrition plays in maintaining health. Sequences dealing with physical examinations and laboratory experimentation will dramatize important facts about nutrition, while other episodes of the film will stress the importance of knowing certain facts about essential foods and how to buy them economically in America—"a land of plenty where an abundant supply of food is available to maintain the growth, health, and vitality of every citizen."

The Visiting Nurse Service of the Henry Street Settlement in New York

City will release during October a picture called "Day After Day." Its theme will center around the relationship that exists between the nurses of the Service and their patients. Four types of cases will be dealt with in the story: the surgical case, the general case, the maternity case, and the crisis case (pneumonia). The film will be used in the Service's forthcoming drive to raise funds. Both 35 mm. and 16 mm. prints will probably be available.

The American Social Hygiene Association is considering the production of a film on gonorrhea. Health departments and other agencies have been circularized to determine whether or not a film on this subject is needed. Replies received indicate that a picture on this subject will be welcomed and production will no doubt go forward in the near future.

Of interest to health agencies is an announcement from England that plans are being worked out for the production of a feature picture covering the history of the International Red Cross. Leading screen artists, technicians, and other film workers will be asked to donate their services in this undertaking. Proceeds from the film will be given to the Red Cross, with whose approval and coöperation the film would be made. The proposed production would not be a propaganda or documentary feature, but a dramatic presentation centering around the life of Henri Dunant, the Swiss banker who contributed so much to the establishment of the Red Cross.

"Twixt the Cup and the Lip" is the title of the latest film produced by the New York State Department of Health. This picture was made primarily for the purpose of promoting higher standards of restaurant sanitation. Methods employed in washing and sterilizing dishes and eating utensils are shown. The film is available in two reel form and distribution is limited to health officers in New York State for showing to restaurant operators, food handlers, and agencies interested in restaurant sanitation. A one reel version of this picture may be released at a later time for theater use.

SEEING SNEEZES

We ordinarily have a deep-seated aversion to writing anything on the subject of sneezes simply because our sneezes have a habit of coming on at times calculated to cause us no end of embarrassment. In the theater, for example, we seem to have a tendency to sneeze just at the time when the star is delivering the most important lines of the play. Thus we become the subject of a thousand scowling glances. Or again we are apt to sneeze in the midst of some dignified ceremony only to receive the frigid stares of everyone present.

But, be that as it may, we do welcome the opportunity to comment upon the photograph of a sneeze which was recently released by the Department of Biology and Public Health of the Massachusetts Institute of Technology. This photograph is perhaps already well known to public health departments throughout the country as it has been reproduced in newspapers, magazines, and other periodicals.

"Credit Lines" consulted C. E. Turner, Dr.P.H., regarding the photograph. We learned that the picture was taken by the technic of ultra-high speed photography, which substitutes an instantaneous flash of light for the opening and closing of the camera shutter. This stroboscopic light illuminates the object to be photographed with an intense flash of short duration estimated at 1/30,000 of a second. Thus the droplets expelled by sneezing are photographed before they have scattered or evaporated. The photograph reveals that thousands of droplets are expelled in which large numbers of bacteria are later found to be present. The so-called

"muzzle velocity" at which the droplets travel may be as great as 150 feet a second, though the majority do not travel more than 2 or 3 feet.

Health educators have long sounded warnings about the unstifled sneeze or cough. But their warnings have for the most part gone unheeded. Thus the actual photograph of a sneeze which makes visible the dangers of droplet infection should be a "natural" for poster use and other publicity purposes. Health and welfare agencies may reproduce the photograph. Inquiries concerning its use should be sent to the Department of Biology and Public Health of the Massachusetts Institute of Technology, Cambridge, Mass.

Dr. Turner is to present a paper at the Detroit Meeting in which the use of the new photographic apparatus and its possible application in the field of public health and health education will be described.

Stroboscopic light, the essential device needed to make pictures similar to the sneeze photograph, will be placed on the market soon by the Eastman Kodak Company. It will be known as the Kodatron Speed Lamp.

WHO WILL WIN?

"Round one" in a lively controversy over the relative merits of the older epidemiological case finding methods in tuberculosis, including primarily the examination of family contacts, in contrast to the more recently developed mass tuberculin testing and x-ray program, was staged at the last meeting of the National Tuberculosis Association in Cleveland. The heavy-weight contenders in this controversy were Edward S. Godfrey, Jr., M.D., and J. Arthur Myers, M.D., with Allen W. Freeman, M.D., as "third man in the ring."

Dr. Godfrey led off by stating that he condemned the promiscuous tuberculin testing of school children as a waste of time, money, and effort, at least until the real job is done. The real job, maintained Dr. Godfrey, was that of finding and isolating cases of tuberculosis among families in which a known case is or has been present. He added that special emphasis should be devoted to securing the medical examination—including x-ray—of the adult members of such households.

Dr. Myers countered with a statement in which he conceded that a method that should be emphasized is the search for cases among family contacts, but that mass tuberculin testing should be extensively used for the finding of cases in those states and cities in which both the death and case rate from tuberculosis have been very substantially reduced.

Dr. Freeman balanced the arguments by stating that a year or two ago he would have upheld Dr. Godfrey's contention, yet he had recently had several students in his courses at Johns Hopkins who convinced him that there is substantial value also in mass tuberculin testing. Dr. Freeman felt that both Dr. Godfrey and Dr. Myers were right. He advocated considerable concentration of effort on the discovery of tuberculosis among family contacts in states and cities where the death rate is high or fairly high, and a judicious use of both measures in states and cities where the rates are low or fairly low.

If tuberculosis is to be wiped out in the next two decades, it will be the outstanding event of our times in public health. Consequently, ringside seats will be at a premium if and when Drs. Godfrey and Myers engage in the second round in this "battle of the century."

THE ANSWER IS YES

Has our health education campaign succeeded? Has our message impressed the public? These and similar questions always arise when health educa-

tors begin to take stock of their efforts. Everything from Gallup polls to quizzes have been used to answer these questions, but we know of no instances in which such a clear-cut answer has been obtained as that cited by Clarence C. Little, Sc.D., of the American Society for the Control of Cancer.

Dr. Little's statement, which appeared in the Society's *National Bulletin* under the title "As Goes Maine . . . ," follows:

" The problem of obtaining data concerning the value of cancer education is a difficult one. There are so many elements, both of subject matter and of personnel that enter into the process of educating the public on cancer that it is difficult to obtain information concerning the success of the Society's campaign. For that reason data obtained by the Tumor Clinic in the Maine General Hospital at Portland are of particular interest.

" In order to evaluate it properly it will be well to remember first, that Maine has made the best record of any state in establishing and supporting the Women's Field Army; and second, that it is a conservative state in which change is the exception and established order the rule.

" The number of total new patients coming to the Tumor Clinic at the Maine General Hospital in Portland were for successive years ending March 31 as follows: 1935, 93; 1936, 79; and 1937, 88.

"At this point the first campaign of the Women's Field Army had been completed and the movement was gaining strength. Let us see what the following three years show—1938, 185; 1939, 229; and 1940, 287.

" There is no need for complicated statistical interpretation of these figures. They tell an impressive and encouraging story. They indicate what we may expect to find all over the country as the work progresses.

" It is this sort of result that in times of doubtful values and shifting ideals stands out as a beacon to guide and revitalize those who are giving their efforts to save lives from cancer. As the results accumulate we shall find that the slogan Fight Cancer with Knowledge, is no empty phrase."

ADVANCES IN DENTAL EDUCATION

In the autumn of 1941, Harvard University will inaugurate a new plan of dental education made possible by contributions from several philanthropic foundations. Under the new plan, the present Harvard Dental School will be re-named the Harvard School of Dental Medicine. The course of study will be extended from 4 to 5 years and will combine in increased measure the basic knowledge and skills of both medicine and dentistry.

Dental students will register in both the School of Dental Medicine and in the Harvard Medical School, taking 3½ years of the same medical courses required of students in the medical school, and in addition 1½ years of specific dental training. Dental graduates will be granted both the M.D. and D.M.D. degrees.

It is announced that admissions to the School of Dental Medicine will be governed by the same standards and the same committee which govern admissions to the Harvard Medical School.

OF ANCIENT VINTAGE

Health education is generally regarded as having had a comparatively recent origin. Hence it may be surprising to learn that as long ago as 1781 the Massachusetts Medical Society gave as one of its primary purposes the diffusion of medical knowledge. In 1846, the first president of New York Academy of Medicine included the enlightenment of the public mind " on the subject of medicine and its collateral branches of science " among the

Academy's objectives. Later, in 1902, Dr. Andrew H. Smith, in an address to the New York Academy of Medicine, made some observations which show that health education was beginning to receive serious consideration. Dr. Smith's remarks are worth quoting because his views are as valid today as they were in 1902:

> The world has a right to know and it is our duty to tell, just what progress we are making . . . , the steps by which results are obtained, the difficulties we meet with, the uncertainties which are still to be cleared up, the problems which are pressing for solution. Inability to make these things known is the explanation of the failure of scientific medicine to obtain that hold upon popular recognition and respect which it obviously deserves, while the most impudent and absurd parodies upon it are eagerly accepted by a public which is credulous in this respect only because in this respect it is ignorant.

A HEALTH OFFICER THINKS IT OVER

An item in a recent issue of the *Bulletin* of the North Carolina State Board of Health reveals, we think, certain reactions which many health officers must experience as various cases and situations are weighed and reviewed. Items of this sort are rare—hence we quote Dr. John W. Williams, Health Officer of Martin County, N. C.:

"A local physician was called in the country to a fifteen year old unmarried Negro girl. He found her having eclamptic fits due to pregnancy. She was carried to a hospital, labor was induced, a live baby was born and the girl died. Ways to view it.

"*Materialism*—That Negro girl was trying to carry an illegitimate baby to birth. Her kidneys could not take care of the extra burden, so she died.

"1. The county has the expense of transportation, hospitalization, physician's fee (perhaps), and burial, besides the tax of keeping a health department to prevent this type of case.

"2. There will be a Negro orphan baby to starve or exist—without even an ignorant Negro mother's care.

"3. The county and state have one more unit to add to their maternal mortality percentage.

"4. A farm hand capable of producing a crop of beans, as well as babies, died in her best productive age for each.

"*Christianity*—But would it not be best to look at it from just the humane side—forgetting color, intellect or creed, and say—'It's a damnable shame on all of us that some one of us did not help her to one of our weekly prenatal clinics and save her?'"

MAGAZINE ARTICLES

Current popular magazine articles on health or of medical import:

"The Vitamin Way to Health." Maxine Davis. *Cosmopolitan Magazine.* September, 1940.
"They Need Not Die." J. D. Ratcliff. *McCall's Magazine.* September, 1940.
"Mad Dogs." A. Williams. *Good Housekeeping.* August, 1940.
"Tropic Killer." J. D. Ratcliff. *Colliers.* August 10, 1940.
"If It's Chicken Pox." Hope Satterthwaite. *Parent's Magazine.* September, 1940.
"Highlights About Vitamins." Victor Heiser, M.D. *Better Homes and Gardens.* August, 1940.
"Safety on the Screen." E. I. Woodbury. *Business Screen.* Number 7.
"Cotton Field Clinic." J. D. Ratcliff. *Survey-Graphic.* September, 1940.

(The above is not presented as a complete list and the articles cited are not necessarily recommended.)

Hints and Hunches

Good copy—Tips on how to write good copy according to a *Time Magazine* advertisement:

> Journalism in the U.S.A. pours out millions of words each week; *Time's* limit is some thirty thousand. And when every word must do the work of a dozen, it needs to be a better word, and more economically joined to its fellows. Nouns must paint landscapes, adjectives must do portraits, verbs must shoot straight.

Health educators might try to follow *Time's* formula, especially in connection with the wording of health slogans in which success or failure depends upon phrasing that "shoots straight."

Physicians as authors—Hardly a week passes without the announcement of a new book from the pen of a physician. In fact the list of books written by doctors has so increased that one is inclined to think that perhaps authorship and the practice of medicine are allied arts. It has been suggested that this literary trend may eventually lead some of the progressive medical schools to set up courses in fiction to teach potential physicians how to make novels out of nutrition and touching tales out of ticks and tonsils!

Health of the CCC—Young men enrolled in the Civilian Conservation Corps have shown marked improvement in health. According to a recent report, 25 per cent of the young men who sought enrollment were substandard in weight. It was necessary to waive weight requirements in order to fill quotas. Another 45 per cent were below standard weight at the time of acceptance. After 6 months of CCC training, an average gain in weight of 8.16 pounds was noted.

Conferences—"Staff conference tomorrow at 10 A.M." This familiar item can frequently be found on the bulletin boards of all health departments as the conference method of planning activities or programs has become an established procedure. *Printer's Ink Monthly* for June, 1940, carries some thought-provoking comments on the subject of conferences that are well worth remembering.

The publication states that the following quotation should be hung in every conference room: "They think that winning an argument is what matters, not learning the truth." Elaborating upon this, *Printer's Ink* adds:

> A great many conferences resolve themselves into clashes of will when they should be exchanges of opinion. Most conferences are participated in by individuals who have reached their positions by force of character. Having that they also possess pretty decided ideas. Therefore in too many cases they enter the conferences with the idea of imposing their wills on others rather than of learning the truth. A conference is worth nothing if it is not based on an honest desire to get at the truth in order to lay out a course of action. It will only succeed when the arguers realize that it is not the argument that matters, but the truth.

Nutrition—A new approach to the study of nutrition is being undertaken by the North Carolina State Board of Health, the University of North Carolina, Duke University Medical School, and the Rockefeller Foundation. Proceeding on the theory that the basis of sickness prevention lies in the building of healthy bodies that are able to resist infection, several North Carolina families are being placed under 7 day observation periods for the purpose of determining the immediate effects of

specific diets. Individual records are being kept for each member of the families under observation, each of whom is given a thorough physical examination prior to going on a supervised 7 day diet. Important conclusions are expected to result from the comparison of blood analyses made before and after the 7 day diet. It is hoped that data resulting from this study will lead to effective ways of combating the subclinical dietary diseases which perhaps frequently lead to degenerative illnesses.

CATCH-ALL

Since Sweden has fallen under the domination of a foreign power, it is doubtful that the Nobel prizes will be awarded this year. A movement is now under way among former Nobel prize winners to keep the custom alive by transferring to some agency in the United States authority to make the awards. . . . Under the auspices of the American Red Cross and Harvard University, plans are under consideration for the establishment of a hospital in England for the study and treatment of communicable diseases under wartime conditions. . . . Joseph Meister, who at the age of 9 was the first person to receive the Pasteur treatment for rabies in 1885, committed suicide in Paris recently. Apparent reason: Despondency over being separated from his relatives after the occupation of Paris. . . . It is reported that pure narcotics have become so scarce that many addicts are curing themselves unwittingly by buying highly diluted products. . . . The Blood Transfusion Betterment Association has been organized in New York City to mobilize volunteer blood donors to supply blood plasma for use in transfusions to the British war wounded. It is hoped that 300 liters of plasma will be obtained every week for shipment by Clipper plane. . . . Statisticians of the National Safety Council announced that America's traffic toll for the first half of 1940 was 1,040 greater than for the same period last year. Deaths for the first 6 months of this year totaled 14,740 compared with 13,700 at the halfway point last year—an increase of 8 per cent. . . . Thirty per cent of the recent volunteers for United States Army service in the New York metropolitan area were rejected because of bad teeth, poor vision, flat feet, bad hearing, or general debility. . . . The President's Interdepartmental Committee to Coördinate Health and Welfare Activities has requested an appropriation of 5 million dollars for the purpose of supplying health and medical services to migratory workers. . . . Next to the venereal diseases, mumps is the most disabling of the acute infections among military recruits. . . . Cuban postal authorities are issuing a stamp to commemorate the founding of Cuba's first medical journal which was established a century ago. . . . A diet for expectant mothers costing only 34 cents a day has been worked out by nutrition experts at Columbia University. The diet is said to provide generous amounts of all the necessary food substances. . . . Authorities in New York State have appointed a trichinosis commission to investigate all phases of the disease and to recommend appropriate legislation looking to its control. . . . Metro Goldwyn-Mayer Pictures has released a short subject picturing the experiences of Dr. Joseph Goldberger, who did pioneer work in discovering the causes and cure of pellagra. . . . According to Perrin H. Long, M.D., of Johns Hopkins Medical School, 300 tons of sulfanilamide and its allied compounds were used during 1939. . . . Memo to our readers: Don't forget that the editors are expecting contributions from you and you and you.

Abstracts

A Symposium on Adolescence

Harold H. Mitchell, M.D., F.A.P.H.A.
District Health Officer, Department of Health, New York, N. Y.

As the concept of the medical and nursing part of the school health program broadens beyond the mere correction of physical defects, interest grows in the service that might be rendered to secondary schools. With new knowledge of growth, not only in terms of increase in mass, volume and external dimensions, but of development in the sense of increasing complexity, we become increasingly aware of the possibilities for the physician and nurse in the school to serve the educators who are concerned with the whole child in high school education. This awareness of an undeveloped field for public health service probably accounted for the enthusiastic reception which was given to the Symposium on Adolescence presented at a Joint Session of the Child Hygiene and Public Health Nursing Sections of the American Public Health Association and the American School Health Association at Pittsburgh, October, 1939.

Studies on Growth and Development of Adolescents and Their Implications for the Health Program of the Adolescent—William Walter Greulich, Ph.D.

The Symposium was planned to indicate the results of those studies on growth and development of adolescents which have definite implications for the school health program. This phase was presented by William Walter Greulich, Ph.D., of the Adolescence Study Unit of Yale University, School of Medicine. He indicated those growth patterns and trends in growth and development of adolescents which are essential for interpreting to the educators such individual differences as affect the adolescent's adjustment to school demands.

Changing Body and Changing Self—Caroline B. Zachry.

Dr. Caroline B. Zachry, as Chairman of the Study of Adolescents for the Commission on Secondary School Curriculum of the Progressive Education Association, presented an equally helpful discussion of the interrelationships of the physical and psychological factors which influence the behavior of the adolescent. With illustrations from case studies, she showed some of the interpretations necessary for meeting the perplexities commonly seen among high school pupils and influencing health as well as emotional equilibrium.

The Adolescent in a Changing World—A Summary—Lawrence K. Frank.

Lawrence K. Frank of the Josiah Macy, Jr. Foundation, in a very practical summary of current investigations of adolescent development pointed out that "medicine and public health have more to contribute to secondary education than physical examinations and correction of defects." He was particularly inspiring as he suggested new fields of service through an under-

standing of how social and cultural situations affect boys and girls in this period of physiological instability and as he suggested that medicine and public health might foster the clinical attitude and bring the new knowledge of adolescent growth and development to education, in order to protect adolescents from educational exploitation and the neglect of individual needs.

Journal of School Health (3335 Main St., Buffalo, N. Y.), May, 1940.



nnual Membership Roll Call, November 11–30, 1940

BOOKS AND REPORTS

Civil Service in Public Welfare—*By Alice Campbell Klein. New York: Russell Sage Foundation,* 1940. 444 pp. Price, $2.25.

The increasing shift of personnel engaged in the practice of public welfare from private to civil service auspices has created a widespread need for this manual to guide the social worker in her local civil service problems. The author in her many years of experience in the fields of public health and social work has been in position to familiarize herself with general placement problems in public welfare work as well as with state-wide civil service examinations.

The extension of civil service into the realm of public welfare has brought problems to the foreground in the program of the social worker demanding a clear and workable knowledge of a hitherto vaguely understood field.

The book is divided into two main parts. Part one, dealing with the functions and procedures of civil service, is intended to serve as an introduction to civil service history and practice. Part two, "Where Social Work and Merit Systems Meet," considers in detail those points where civil service affects the realm of public welfare. An appendix outlines the standards for a state merit system of personnel administration.

The twofold objective of the modern civil service program is, the author declares, the application of the merit principle to the selection, promotion, and management of government personnel, and the achievement of security of tenure, reasonable working conditions, and adequate compensation for the employees. Our present merit system can only be understood after a consideration of its historical backgrounds and the changing political concepts. A brief discussion of civil service history is included together with definitions of the terminology employed by students of the civil service system. The growth of the program in the United States is traced through federal, state, county, and municipal legislation, and emphasis is given to the recently developed special departmental systems established under the impetus of the Social Security Act in states still lacking state-wide civil service systems.

But the path of civil service progress has been beset by serious impeding forces. These are considered under the headings: inadequate appropriations, preferences to special groups, residential restrictions, disregard of merit rules in choice of candidates, and a tendency to include financial need as a basis for selection. Examples of the functioning of these forces are presented as well as the dangers inherent in their practice. In summary, the author maintains that the merit principle in public personnel administration is under constant attack because it cuts across all forms of special privilege.

The problem of civil service organization is next treated with special reference to the use of the bipartisan commission as against the bureau chief directed department, it being pointed out that both plans have proved workable.

The importance to social workers of a knowledge of the functions and technics of civil service agencies is stressed. The major functions of the agency are discussed in detail including the classification of positions and com-

pensation, recruitment and selection of personnel, examinations, scorings and types of certifications, conduction of periodic ratings, provision for in-service training, vacations, and the handling of appeals. Attention is especially directed toward the practical aspects as well as the aims and purposes of the various procedures. Advantages and disadvantages of certain types of examination questions are considered and numerous examples are supplied. A plea for an objective view toward oral examinations is included which is followed by a discussion of the need for a revision of opinion regarding the great value of the interview in the evaluation of a candidate.

The second division of this work deals with more controversial aspects of the problem. The author maintains that the application of merit systems to public social work is so recent that only tentative opinions may be held.

The future development of the merit system depends in turn upon the social worker, and definite ways in which members of this group can help its promotion are outlined. The need for cooperative action with other community groups which share the social worker's objectives is stressed. The advantage of a flexible administration and compromise is noted, while at the same time the author insists that public welfare positions be fully protected against encroachment by special groups.

IRA V. HISCOCK

Psychiatric Clinics for Children: With Special Reference to State Programs—*By Helen Leland Witmer, Ph.D. New York: Commonwealth Fund,* 1940. 437 pp. Price, $2.50.

This book is much more than its title indicates. It is by no means a dry compilation of facts and figures of psychiatric clinics and state programs. The Introduction, contrary to the usual manner, actually tells us what we are to expect in the following chapters. Chapter I on the "Basis of Child Psychiatry" with just enough theory to give it spice is delightfully written and gives one a clear-cut picture of the development of psychiatric clinics in this country with special reference to the influence of Adolf Meyer, William A. White, G. Stanley Hall, and Salmon. It points out clearly the unique contribution of Meyer in centering "interest in total behavior and in the social and emotional genesis of mental disorders."

The early history of psychiatric clinics for children and the development of demonstration Child Guidance Clinics together with a summary of present clinic services complete the first part of this instructive volume. The second part concerns itself with a survey of state financed clinics with considerable detailed material.

The third part lays down principles for future programs based upon the experience already gained. Theory and practice are judiciously balanced throughout. The book is well conceived and exceedingly well written. It should prove very helpful to all those who are struggling to bring body, "mind" and "soul" together in this topsy-turvy world.

RICHARD A. BOLT

The Development of Public Health in Canada—*Edited by R. D. Defries. Toronto: Canadian Public Health Association,* 1940, 184 pp. Price, $1.25.

This most useful and interesting book opens with a Preface by the editor which gives a summary of leading facts. The first article, "Public Health in Canada," is by Dr. Heagerty, who is so well known for his history of medicine in Canada. These are followed by articles written by the Health Officers of each Province and, except for an Appendix giving the public health expenditures by the Provincial govern-

ments for 1937, the book ends with a description of The Health Section of the Department of Pensions and National Health, Canada, with its many activities.

The Dominion of Canada as a country dates back to the British North American Act of 1867, though the Eastern provinces especially had been settled long before, hence many "firsts" can be justly claimed. The first census of the world in modern times was in Quebec in 1666, followed by the first system of records of birth, marriages, and deaths in that Province in 1667, a system which has been continued and which gives Quebec "a heritage of vital statistics unique in the world." The Indians had discovered a cure for scurvy and given the information to Cartier who used it successfully, antedating James Lind's discovery of lemon juice by more than 200 years. We are accustomed also to thinking that the French are backward in what we now call public health, yet from the date of the establishment of the Colony of La Nouvelle France more than 300 years ago, registration of births, marriages, and deaths was regularly carried on by the clergy, and in 1667 we find the people meeting to demand legislation concerning the quality and weight of bread, and in 1707, an act was passed to insure proper handling of meat. Child welfare also had some consideration. The Hôtel Dieu was opened in 1639. In 1721 the Intendent introduced quarantine regulations to prevent the importation of plague from Marseilles. While the new country, through certain provinces, thus gained a great deal from France, the Dominion of Canada, formed by the British North American Act in 1867, has largely followed England, whose great Public Health Act, passed in 1875, led in 1882 to the adoption of a public health act in the Province of Ontario, which was the most important public health legislation which up to that time had taken place in Canada.

The record of contagious diseases in various parts of Canada in the early days is sickening. The editor well says, "No part of the story of Canada is of greater interest than the attempts made by the pioneers to meet the ravages of disease." The Indians, according to Cartier, showed many signs of illness, blindness, lameness, and weakness. With the appearance of the whites the diseases of the civilized men rapidly spread to the Indians. Smallpox occurred in repeated epidemics, creating great ravages and nearly exterminated some of the tribes in eastern Canada. Perhaps next to smallpox—and by some placed first—was a succession of epidemics of cholera beginning in 1832. Typhus raged at times. Its prevalence in 1847 led to the appointment of 75 boards of health, and two years later a Central Board of Health was established to deal with epidemics. Influenza took a heavy toll in 1826.

While Canada had a Department of National Health in the Dominion Government, which was a decided advance in the organization of general public health measures, a Federal Department of Health was not created until 1919, following the World War. This has fostered a close relationship between the Provinces and the government in all health matters. There has been also developed a Dominion Council, an advisory body made up of the medical health officers of all the Provinces with certain other representatives.

The Editor makes graceful acknowledgment to the Rockefeller Foundation for the creation of a School of Hygiene at the University of Toronto, which, in addition to many other useful functions, now has fellowships for training public health personnel. The Rockefeller Foundation has also provided fellowships for health officers, public health nurses, and other public health depart-

ment personnel, and has participated in many other public health projects.

The accounts given by the health officers of the various Provinces are very interesting, and well repay one for the reading, but only a general review can here be given. This history is a well planned and well done work for which all owe a debt of gratitude to the Editor, writers, and to the Canadian Public Health Association.

MAZŸCK P. RAVENEL

Nursing Mental Diseases — *By Harriet Bailey (4th ed.). New York: Macmillan,* 1939. 264 pp. Price, $2.50.

The author has had years of experience as an educator and administrator in the field of mental nursing and also wide contact with schools of nursing as inspector of schools for the University of the State of New York. She refers in her preface to the growing acceptance of the inclusion of psychiatric nursing in the basic course of our nursing schools, hence, the timeliness of this expansion of her textbook on this subject.

The chapters are logically arranged, beginning with a brief but interesting history of the "Care of the Mentally Sick," and including such important subjects as "Some Legal Aspects of Mental Disorders," and of special significance to all nurses, a discussion of "Personality Development, Alteration and Adjustment." These introductory chapters are followed by a discussion of causes, a general classification of mental disorders (using the revised classification adopted by the American Psychiatric Association), symptoms and how to observe them, a discussion of qualifications for mental nursing leading directly into some of the difficulties in dealing with such general nursing problems as the administration of food, the nurse's part in aiding the patient to overcome insomnia without undue dependence on drugs, and some of the safeguards in dealing with the mentally ill. After a brief chapter on accidents and emergencies and the nurse's part in dealing with or preventing them, the author takes up chapter by chapter various classes of mental disease.

The same general order is used in discussing each subject, a definition of disease, physical symptoms, mental symptoms, nursing procedures and occupations, diversions and exercise, as it applied to each type of illness. The last three chapters deal more in detail with the therapeutic measures especially developed in a hospital for the mentally ill, giving for example detailed lists of occupations for men and for women, games and recreation; then the physiotherapy treatments and their significance; winding up with a chapter on mental hygiene.

While this book points out the positive and preventive aspects of the nurse's work in the mental health of all patients and their families with whom she comes in contact, still it is so definitely written for the nurse working with the mentally ill that its use for the young student should be introduced only after adequate preparation in general psychology and with the interpretation of a wise teacher. Miss Bailey indicates the appeal of this field of nursing to the intelligent nurse, but she would have made it even more challenging if she had added more concrete illustrations of human behavior such as the two examples given in the chapter on therapeutic measures. The bibliography and glossary add to the usefulness of the textbook.

MARGUERITE WALES

The Law of Public Housing— *By William Ebenstein. Madison: University of Wisconsin Press,* 1940. 150 pp. Price, $1.75.

Since bad housing unquestionably fosters disease, crime, and other social ills, it is the proper function of govern-

ment to use its police power, its tax power, and its power of eminent domain to eradicate slums and blighted areas. The need for such action, the status and operation of federal and state housing legislation, the attitude of the courts on these matters, and the housing experiences in foreign nations, are set forth in this scholarly, well documented book. Appendices give the texts of the United States Housing Act of 1937, and two leading court decisions. There are a table of cases and a good index. The book should be valuable to all who are concerned with public housing as a social, sanitary, and legal problem of great current significance.

JAMES A. TOBEY

Refuse Materials: Classification of Refuse Materials, Definitions, Characteristics, Quantities Produced—All in Relation to the Problem of Refuse Collection—*Bulletin No. 8. Chicago: American Public Works Assn.*, 1940. 44 pp. Price, $.50.

This bulletin by the Committee on Refuse Collection of the American Public Works Association will eventually become a chapter in "Refuse Collection Practice"—a larger publication of this association.

After defining various classifications of refuse and describing methods of measuring quantities of this material, the committee has given the amounts actually collected in various cities. These data were obtained from nearly two hundred municipalities located throughout the country.

The wide variations noted in these quantities would tend to make predictions of amounts to be collected rather difficult. However, when local conditions are considered, accurate estimates can probably be made, not only for a particular city but for seasonal variations within that city.

The estimates thus obtained will be of value in planning collection activities and equipment and in financing operations. They can also be used for estimating incinerator capacities, land fill areas or quantities of other disposal facilities.

F. J. MAIER

Third Annual Symposium, Department of Industrial Medicine—Northwestern University Medical School. *Chicago: Northwestern University*, 1939. 125 pp. (flexible cardboard covers). Price, $2.00.

The symposium was held September 25 and 26, 1939, and devoted to scientific sessions followed by a banquet session with an address by Dr. Walter L. Bierring, Health Commissioner of Iowa, upon "The Past and Future of Preventive Medicine." Papers in the Scientific Sessions were as follows: Nontuberculous pulmonary diseases, by Ernest E. Irons (clinical aspects) and Hollis Potter (radiological aspects); kidney diseases of mid-life, by Hermon O. Mosenthal (clinical aspects) and J. P. Simonds (pathological aspects); soap—a cleanser and irritant and its rôle in occupational dermatitis, by James Herbert Mitchell; welding—gas and electric, by Eugene L. Walsh (importance as a health hazard) and James A. Britton (protection of operators); and a group of four papers on common beneficent uses of poisonous metals and alkaloids—economic importance and health hazards: (1) Lead and lead alloys, by Marcus A. Grossmann; (2) health hazards and the use of "Ledloy," by A. G. Kammer; (3) metallic salts and alkaloids in agriculture, by Ray Hutson (entomologist); and (4) protection of the health of the grower, the handler, and the consuming public, by W. A. Ruth (horticulturist). The discussions following the various papers are with the report and constitute a very valuable feature.

The Department of Industrial Medicine was established in 1936 as a section of General Medicine, is supported

by a group of industries and the university, and coördinates the equipment and staffs of the various departments of the university and Passavant Hospital. The purpose is an intensive study of individuals who claim disability through occupational exposure, with methods of treatment and essentials in prevention, while actual cases are used for teaching and the department disseminates useful information not only to those immediately concerned but to public officials and the general public.

As with the preceding annual reports, the format is a photoprint of carefully edited typed material with the inclusion of photographs and charts. Several papers give extensive references. The table of contents serves as an index.

The whole project with the annual symposia comprise a well conceived and virile contribution from one of the most extensive industrial centers in the world.

EMERY R. HAYHURST

Digest of Laws and Regulations Relating to the Prevention and Control of Syphilis and Gonorrhea in the Forty-eight States and the District of Columbia—*Compiled under the direction of Bascom Johnson, LL.B. New York: American Social Hygiene Assn.*, 1940. 438 pp. Price, $5.00.

State legislation for the control of the venereal diseases in effect on September 1, 1939, and the rules and regulations of state health departments on this important subject, have been ably summarized in this well printed and well arranged book. The digests of the laws and regulations are presented for each state under the headings: (1) power to make rules and regulations; (2) relations to public health; (3) reporting; (4) examination; (5) treatment; (6) quarantine; (7) infecting or exposing another to infection; (8) advertising cures; (9) sale of remedies without prescription; (10) requirements pertaining to marriage; and (11) ophthalmia neonatorum.

Appendices give brief digests of federal laws and regulations on venereal disease, and specimen state laws on vice repression, and on premarital and prenatal examinations. There is a Foreword by Surgeon General Thomas Parran of the U. S. Public Health Service, which coöperated in the preparation of this useful book, and which might well have published it, so that it would have been available without charge to the payers of the innumerable manifest and hidden federal taxes.

This Digest should be valuable to all who are interested in new, and perhaps better legislation on venereal disease control, provided that they use it as a guide and not merely as a model.

JAMES A. TOBEY

Health Syllabus—*Mississippi State Board of Health, Jackson, Miss.* 1940. 63 pp. Distributed free of charge.

This booklet of 63 pages is excellent. It begins with "A Brief History of Health Work in Mississippi," and has arranged by years in tabular form "Milestones of Public Health in Mississippi, 1799–1938." It describes the organization of the State Board of Health, and in page after page covers not only the duties performed but gives to the lay public an idea of the necessity of these functions. At the end there is a list, under appropriate headings, of pamphlets which can be obtained free of charge from the State Board, also a good index.

The Syllabus was prepared for use in secondary schools and is excellently adapted to the purpose. At the end of each subject are questions which emphasize the points in the text and insure their understanding. It can be recommended also to the general public, which as a rule knows too little of health affairs.

Among numerous excellent illustra-

tions are found reproductions of photographs of the first Board of Health of Mississippi (1877) and of the secretaries since the year 1877. The printing and make-up are excellent.

MAZŸCK P. RAVENEL

Panum on Measles: Observations Made During the Epidemic of Measles on the Faroe Islands in the Year 1846 (A translation from the Danish)—*By Peter Ludwig Panum. New York: Delta Omega Society, 1940. Distributed by American Public Health Association.* 111 pp. Price, $2.50.

Here is a model of dignity, restraint, honesty, accuracy and intellectual stimulation; a rare and precious publication; 111 pages of medical treasure, named from the kernel of 20 pages in which the observations of that remarkable physiologist and epidemiologist, Peter Ludwig Panum first revealed his quality in analytical literature.

From the frontispiece portrait of the rugged devotee of truth and logic to the final tabulation of complications causing deaths of measles patients, there is not a superfluous or irrelevant word.

Preventive medicine whether as a science and art or as a cultural and historical discipline of higher education, is indebted to the Delta Omega Society for adding this volume to its series of classical texts in public health.

The editorial direction has been scholarly and sympathetic. The note on the transmission and the introductory chapter by Dr. Doull are sufficient and admirably expressed. The biography of Dr. Panum by his contemporary and colleague Dr. Peterson illuminates the record of a professional career of 40 years following his first official duties as a candidate in medicine and surgery when sent to the Faroe Islands in July, 1846.

Nothing could be more satisfying as foundation, background, and preparation for the analysis and conclusions on the epidemic than the description given by the observant physician of the characteristics of the Islands, their climate, the people, and their work, habitations, clothing, and eating habits, and the bearing of these on the prevalence of such diseases and causes of death as distinguished these unique communities of hardy folk from those of contemporary Denmark. It is not only to the good fortune that the translators of the several texts of Danish authors have been persons of high cultural attainments, that we can credit the high literary quality of the text. The authors themselves and particularly Dr. Panum used language as an exquisite tool for expression whether in description or analysis. There are gems of brevity and lucidity which are in sharp contrast to the often slovenly and overloaded journalese of health department reports of today in this country.

Part II of the Panum text, pp. 54 to 73, is the treasure trove of the volume, already made familiar to many students of epidemiology and communicable disease control through the teaching of Frost, to whom most appropriately and with universal affection the volume is dedicated.

This little book in its modest brown binding, with its simplest of titles cannot fail to be deeply satisfying to the soul of sanitarians. It should serve as a testament for all disciples of clear seeing and honest thinking.

The three appendices serve a useful purpose as notes and supplementary confirmation of the main text.

Bibliophiles may cavil at certain unorthodox printing practices in the matter of Latin words and phrases, but this is a trifling detail compared with the general excellence of the volume in form and substance.

Like the republished volumes of Budd and Snow, this book will be sought, studied, and appreciated by

physicians and others concerned with preventive medicine and public health as long as reason rules. This is an indispensable book.

HAVEN EMERSON

Fourth Saranac Laboratory Symposium on Silicosis—*Edited by B. E. Kuechle. Wausau, Wis.: Employers' Mutual Liability Insurance Co.*, 1939. 370 pp. (paper). Price, $3.00.

This report is by far the most extensive of the four covering as many symposia on silicosis held at Saranac Lake, 1934, 1935, 1937, and 1939. It comprises 36 papers presented June 19 to 23, 1939. The Chairman, Dr. Leroy U. Gardner, pointed out that this symposium, was a radical departure from previous ones in that basic facts pertaining to etiology, pathology, roentgenology, diagnosis and prevention, which previously constituted the entire subject matter, were presented in abbreviated form for the first day's program, to accomplish which some of the speakers prepared comprehensive outlines of their subjects. Many of the corresponding papers, however, appear to be unabridged. The next three days dealt with conditions in specific industries, beginning with those which have no particular dust hazards, and passing in succession through those involving the use of increasing quantities of silica. Thus, mining in dolomite, the gypsum, cement, granite, Ontario gold mining, and the foundry dust problems come in for major attention. The asbestos industry has been purposely omitted for lack of time and because experience is still limited. The last papers are devoted to the subjects of prevention, control, and compensation.

Most subjects of long standing interest have been brought up to date in keeping with new knowledge and opinions. A brief summary is given of the discussions which follow most of the papers, from which it is evident that, while majority agreement is assuming form on many mooted questions, there is still division of opinion on many others. A symposium of this sort presents unequalled opportunity for announcing new observations, also of more closely defining the terms and expressions commonly used. The reviewer is moved to ask whether the expression "tuberculosis positive" should not be unequivocally defined? Is it based on clinical, pathological, and x-ray findings or upon actual demonstration of the presence of the tuberculosis organism itself? Has the disability been due to the tuberculous element or was tuberculosis simply found as a terminal affair, a "clean-up squad" in a previous condition of extreme pathology of other types, including non-tuberculous infection?

Space does not permit a listing of the titles of the papers presented, which, however, fall under the general groupings above mentioned. As an Appendix there is included the "Physical Examination of Industrial Workers," recently promulgated by the Industrial Commission of Wisconsin. There were many discussants including some from abroad, and it may be said that an outstanding representation of North American specialists and practical men in the field were present and took part.

The volume contains a number of illustrations and many tables and charts. It represents American and Canadian observations in which the influence of many types of industries enter the picture in contrast to reports from foreign sources, which, while extensive and very complete in themselves, have usually been confined to certain industries or localities.

A fairly comprehensive subject index is included but lacks certain headings, e.g., "prognosis" and "progression of silicosis." Inasmuch as a number of the papers carry references, an author index might well have been added and

particularly an index of the names of discussants. The volume, which is of flexible type with paper covers, is well bound and printed on excellent paper with careful editing and make-up.

To the constantly enlarging group of those interested in silicosis and the effects of other (mineral) dusts and mixed dusts, it is an indispensable work, and one gains the impression that this subject, which has so many ramifications, is gradually coming under mastery with much of more facts and less of theory. EMERY R. HAYHURST

The Reorganization of Public Assistance: Report, 1938–1939—*New York City Department of Welfare. New York: Department of Welfare of New York,* 1940. 193 pp. (Gratis to public officials, etc.)

The present report covering the 18 month period from January, 1938, to July, 1939, is an account of the way in which the Department of Welfare has discharged its task of providing public assistance in New York City. At the start of this period the various welfare activities of the city were integrated under the reorganized department of three main bureaus whose chiefs are directly responsible to the Commissioner of Welfare. All the relief giving functions are coördinated in a Bureau of Public Assistance whose task includes the provision of consultant and supervisory services to the other divisions. The Bureau of Finance and Statistics prepares budget estimates, handles statistics, estimates relief loads, and has charge of accounting, auditing, and the issuance of some 450,000 relief checks monthly. The Bureau of Personnel and Special Services has among its duties the responsibility for the investigation of charges made against employers, and the bringing of legal action against recipients accused of fraud, as well as the direction of the activities of the personnel. The work of the former Emergency Relief Bureau was absorbed by the reorganized department, thus allowing a spread of benefits formerly limited to each of the old units, to the entire field covered by the new administration.

The report is composed of 18 chapters with two final sections devoted to financial and case load statistical tables. Several helpful charts and interesting photographs supplement the text material.

The first 7 chapters deal with a survey discussion of the entire problem, unemployment relief, the set-up and chief functions of the new department, its relations to its employees, to other community groups and the civil service, and administrative costs. The remaining chapters are devoted to a detailed account of the work of the specific relief services through which the department must perform its task.

Following an account of the history of the rise of the city's load of unemployment relief since 1931, which points out the final acceptance of the responsibility of caring for the needy on the part of every level of government, the Commissioner considers the types of persons on relief, noting that 65 per cent of new cases accepted during a 2 month period were persons already known to the department. An analysis of causes of application for aid revealed that more than half the applicants had lost their position in private industry, about one-fifth of the causes were related to illness. Loss of WPA work accounted for 15 per cent of the total, insufficient wages in present employment to meet the needs of their family for 7 per cent, and another 7 per cent had exhausted their unemployment insurance funds. Other aspects of the unemployment relief problem treated include the lag between business and employment curves, unemployables, social insurance and decent wages as a factor in the reduction of relief.

tions are found reproductions of photographs of the first Board of Health of Mississippi (1877) and of the secretaries since the year 1877. The printing and make-up are excellent.

MAZYCK P. RAVENEL

Panum on Measles: Observations Made During the Epidemic of Measles on the Faroe Islands in the Year 1846 (A translation from the Danish)—*By Peter Ludwig Panum. New York: Delta Omega Society, 1940. Distributed by American Public Health Association.* 111 pp. Price, $2.50.

Here is a model of dignity, restraint, honesty, accuracy and intellectual stimulation; a rare and precious publication; 111 pages of medical treasure, named from the kernel of 20 pages in which the observations of that remarkable physiologist and epidemiologist, Peter Ludwig Panum first revealed his quality in analytical literature.

From the frontispiece portrait of the rugged devotee of truth and logic to the final tabulation of complications causing deaths of measles patients, there is not a superfluous or irrelevant word.

Preventive medicine whether as a science and art or as a cultural and historical discipline of higher education, is indebted to the Delta Omega Society for adding this volume to its series of classical texts in public health.

The editorial direction has been scholarly and sympathetic. The note on the transmission and the introductory chapter by Dr. Doull are sufficient and admirably expressed. The biography of Dr. Panum by his contemporary and colleague Dr. Peterson illuminates the record of a professional career of 40 years following his first official duties as a candidate in medicine and surgery when sent to the Faroe Islands in July, 1846.

Nothing could be more satisfying as foundation, background, and preparation for the analysis and conclusions on the epidemic than the description given by the observant physician of the characteristics of the Islands, their climate, the people, and their work, habitations, clothing, and eating habits, and the bearing of these on the prevalence of such diseases and causes of death as distinguished these unique communities of hardy folk from those of contemporary Denmark. It is not only to the good fortune that the translators of the several texts of Danish authors have been persons of high cultural attainments, that we can credit the high literary quality of the text. The authors themselves and particularly Dr. Panum used language as an exquisite tool for expression whether in description or analysis. There are gems of brevity and lucidity which are in sharp contrast to the often slovenly and overloaded journalese of health department reports of today in this country.

Part II of the Panum text, pp. 54 to 73, is the treasure trove of the volume, already made familiar to many students of epidemiology and communicable disease control through the teaching of Frost, to whom most appropriately and with universal affection the volume is dedicated.

This little book in its modest brown binding, with its simplest of titles cannot fail to be deeply satisfying to the soul of sanitarians. It should serve as a testament for all disciples of clear seeing and honest thinking.

The three appendices serve a useful purpose as notes and supplementary confirmation of the main text.

Bibliophiles may cavil at certain unorthodox printing practices in the matter of Latin words and phrases, but this is a trifling detail compared with the general excellence of the volume in form and substance.

Like the republished volumes of Budd and Snow, this book will be sought, studied, and appreciated by

Social and Biological Aspects of Mental Disease—*By Benjamin Malzberg. Utica, N. Y.: State Hospitals Press,* 1940. 360 pp. Price, $2.50.

This well edited and comprehensive book is a compilation of nearly 20 papers by the author who for several years past has been surveying mental health problems in the state of New York. The 15 chapters of the book are revisions and supplementations of his previously published researches. Dr. Malzberg says cogently that while great improvement has been effected in public physical health "we find an unfavorable picture with respect to mental health . . . If present trends continue, mental disease will soon become our foremost health problem." As he indicates in his Summary, p. 349, the mortality rates have decreased since 1920 and the first admission rates have increased, which means that expectation of mental disease at birth has increased between 1920 and 1930. "We have therefore the paradox that improve-in physical health, as measured by decreased death rates, accompanies, and is, in fact, a partial cause of the increase in mental disease." As the population itself grows older there are more potential people to suffer from the senile psychosis.

Is mental disease increasing or is its earlier detection and the factor of improved hospitalization encouraging more commitments? As above indicated, increased life expectancy is adding to the mental health problem. What of age, marital status, race and parentage as ancillary factors? These are the old and familiar posers which receive extensive consideration and clarification. There is a great deal of detailed statistical work which loses its aridity by virtue of the very readable and succinct text. The 28 page paragraph (chap. 14) discussion of insulin therapy in schizophrenia is sober and moderate in its approval, thus stated "there is good reason to feel encouraged. . . ."

One might well read the final chapter or Summary before the main text. This section gives a clear chronological story of the mental hygiene developments in New York State and also brief, pointed facts which are treated more at length in the text itself.

One cannot do justice in a brief résumé to the painstaking efforts which have gone into this work. Despite the unavoidable formalistic analysis and statistical tinge, we have no hesitancy in recommending this as a necessary text to all who would presume a responsible participation and knowledge in the field of mental health.

M. A. R. HENNESSY

Thirty-third Annual Report of the Metropolitan Water Board, 1938—*By Lt.-Col. E. F. W. Mackenzie, O.B.E., M.C., M.B., D.P.H. London: P. S. King & Son, Ltd., 14, Great Smith Street (Westminster),* 1940. 118 pp. Price, $2.75.

This report is divided into 4 main sections, namely: bacteriological, biological, chemical, and the works efficiency. The introduction includes a detailed description of the new laboratories. In addition to the introduction and the 4 main sections, several other topics of special nature are covered, such as sewage investigation, complaints, special investigation of the Thames River, meteorological notes, routine tables, and references.

The bacteriological section reports upon investigation of the use of brilliant green bile as confirmation of presumptive coliform, investigation of the growth of citrate solution, research for simpler and more specific methods for the detection of the various members of the coliform group, investigation of the Clostridium Welchii test, and examination for the presence of streptococcus and *Bact. paratyphosum* B in

water and sewage. The rôle of soil bacteriology in the examination of water and their relation to tastes is discussed.

The biological section reports upon a study of seasonal variations in plankton in reservoirs. Photo micrographs are made of the samples. Investigation has been made to determine a simple technic for the evaluation of microörganisms.

Some studies were made of the algal flora on filter beds. In addition to the biological work as it applies to the control of filtration and odors, experimental work has been undertaken to forecast when certain organisms may be present.

The chemical section reports upon an investigation of free carbon dioxide in well waters and a study of the dissolved oxygen of the Thames, Lee, and New Rivers and the wells. Chemical analyses were also made of mud taken from the bottom of reservoirs. The chemical section has been working closely with the biological section in its forecasting work.

The works efficiency section reports upon the use of ammonia and chlorine in the treatment of certain supplies and the effectiveness of pre-chlorination. There follows a detailed report upon the samples and operating data at the various filtration plants.

About 40 per cent of the report is devoted to tabulations of results obtained by the various sections in their work.

The report closes with a long list of references on water supply subjects and an abridged index of most of the subjects appearing in previous annual reports and research reports of the Metropolitan Water Board.

M. H. BIDWELL

Industrial Hygiene—*By Various Authors, Edited by A. J. Lanza and Jacob A. Goldberg. New York: Oxford University Press,* 1939. 743 pp. Price, $8.50.

This volume represents the combined efforts of a group of medical specialists centered chiefly in New York City and environs, aided by several men long known in the field of industrial hygiene such as C. D. Selby, Henry H. Kessler, A. J. Lanza, Louis Schwartz, Paul Reznikoff, W. F. Von Oettingen, R. R. Sayers and William J. McConnell. Jacob A. Goldberg has contributed chapters on statistical considerations and problems in workmen's compensation; Harvey Bartle, on hygiene and medical care of workers on American Railroads, and Rosamond A. Goldberg, on the nurse in industry.

The editors have recognized the flexible and changing nature of the definition of an occupational disease and the ever-changing complexities of industrial hygiene which render the subject a difficult one to treat adequately. Emphasis is placed on the concept that industrial medicine is an important component of public health, and involves the principles of preventive medicine. "Industry" is an all-inclusive term, concerned with different kinds of labor which furnish us with everything we use. The growth of medicine in the industrial scheme has been slow but fairly logical. Industrial health hazards were among the first reasons, outside of inherent accidental mishaps, for bringing the doctor into industry. Workmen's compensation laws have resulted in bringing in a large number of part-time and a smaller number of full-time physicians. Thus industrial medical departments have arisen, increased in importance and activities, and the burden of sick absenteeism has greatly extended its scope.

The book is written with the needs and viewpoints of the industrial physician in mind, including important ancillary features such as special therapy, nursing, compensation, health edu-

cation, and the arousing of an inquiring attitude of mind in those engaged in the various sciences.

The chapters vary in length, depending upon the content, and are well balanced in this respect. There is a happy combination of the medical specialist who looks at industry and the relation of his specialty to it, and the experienced industrial physician, working with his technical aids. One is particularly impressed with the recentness of technical information, as well as of proposed and accepted standards. While occasionally one cannot find his specific questions answered, particularly in the chapters devoted to the more purely medical specialties, the book is the most comprehensive recent publication in the field in the English language, and is thoroughly authoritative. There are 50-odd illustrations, many tables, forms, chemical structural formulae and each chapter is followed with a list of references from which, unfortunately, the names of publishers of books are usually missing.

The index is comprehensive, is more topical than analytical, and covers both subject matter and authors cited in the text and references. We have found few errors or omissions. As is usual with the Oxford University Press, the volume is an example of the best printers' and binders' arts.

EMERY R. HAYHURST

For Daughters and Mothers—*By Valeria Hopkins Parker, M.D. Indianapolis: Bobbs-Merrill,* 1940. 138 pp. Price, $1.50.

It is not surprising that Dr. Valeria Parker, who has long been a popular lecturer to groups of young people, would be the author of such a readable and sane book, though it is surprising that any author could manage to talk to both mothers and daughters at one time in a way that appeals to both.

Dr. Parker has covered the usual facts of sex hygiene, of venereal disease, of personality adjustment and social behavior during adolescence, and of personal hygiene in simple and dignified language. The mother who has no words of her own with which to discuss sex with her daughter, will find many suggestions here even though these are not brought together in a "sample talk." This story of sex is woven into problems of amusement, fashions, and school life, so that it does not seem the only subject of importance to mothers and daughters.

There is little preaching in the book and at no point is one aware that the author is focusing unduly on some unpleasant duty that should be performed. Here is exactly the book which would be expected from a person who has long been of assistance to girls and their mothers. LEONA BAUMGARTNER

Parents and Children Go to School—*By Dorothy Walter Baruch. Chicago: Scott, Foresman,* 1939. 504 pp. Price, $3.00.

Dr. Baruch writes out of a full understanding of children and their needs, both from the viewpoint of a successful mother and that of a skillful teacher. She is professor of education and director of the Broadoaks Preschool, Broadoaks School of Education, Whittier College, Pasadena, Calif., where she presides over a program of education in relation to young children which is unique in its basic philosophy concerning the influences which play upon the lives of young children.

Dr. Baruch believes that home and family relationships are so influential upon the life of the child that no school should exist for young children, which does not have as a basic part of its program a close working relationship with the home. This viewpoint is far from that of a few decades ago when the home delegated to the school

the education of the child, and to a large extent followed a "hands off" policy.

Parents and Children Go to School is a day by day account of the activities of children, teachers, and parents in the Broadoaks Preschool. It describes the actual happenings there in the groups of 2 to 6 year old children. Doctors will find this book especially helpful in understanding the mental hygiene aspects of working with children and their parents. Teachers will find in it a clear, detailed, objective picture of a fine nursery school set-up. Parents will hail it for its healthy view of parent education, eg., that "parents aside from being parents, are people in their own rights," and therefore are entitled to any help which will give them a greater measure of security in bringing up their children.

ETHEL GORDON

Your Child's Food—*By Miriam E. Lowenberg. New York: McGraw-Hill.* 299 pp. Price, $2.50.

Here is a thoroughly practical book on feeding young children by one who understands the psychology as well as the physiology of the feeding of preschool children. The book properly opens with a consideration of food habits and their formation. It gives practical suggestions based upon actual observation of children and their nutritional needs. It does not blink the difficulties but meets them squarely with practical and workable suggestions. There are excellent chapters on planning menus for the family, food for special occasions, food preparation, and meal service. The food requirements of the child as a member of the family group are well considered. The book is replete with seasonal and weekly menus and many appetizing recipes.

A number of full page photographs of children in action in relation to their food enhances the value of the book. Parents, teachers, day nursery and nursery personnel will find much help here in carrying out successful feeding of young children.

RICHARD A. BOLT

Beyond the Clinical Frontiers. A Psychiatrist Views Crowd Behavior—*By Edward A. Strecker, M.D. New York: Norton,* 1940. 210 pp. Price, $2.00.

One who is not a specialist approaches a review of this book with diffidence, but since it has been recommended to physicians, nurses, parents, school teachers, and social workers, perhaps such a review will serve the purpose as well as one by an expert.

The author describes his work as a brief discussion of a few of the crises which are menacing our civilization and its cultures; an attempt to show the psychiatric implications of these crises and an outline of a plan of hygiene that psychiatry might be able to offer to a mentally sick world. The arrangement is logical and well carried out. The author does not hesitate to say that "the economic, political, social, cultural, and ethical upheavals" have perplexed a sorely tried and tired world. He realizes that these are "beyond the frontiers of clinical psychiatry"—and from this the title of the book is derived.

The first chapter "A Massive Retreat from Reality," discusses this "as a phenomenon common to psychoses, psychoneuroses, and many other conditions within the boundaries of clinical psychiatry." There is a kinship between the minds of the mentally sick, the thinking of average normal individuals, and the mass behavior of crowds. Pressure from the outside is constantly increasing. Present conditions are making an increasing number of individuals vulnerable though there are personalities which have "enough insulation of intelligence to protect

them against the danger of crowd emotional contact." Mass reactions are more common than ever before. Our democracy has not protected us from crowd mindedness " and the mass-man has appeared in the United States." The weight of evidence is that " a crowd thinks, feels and behaves on a much lower level than those customary to the individuals composing it. The debasement of behavior is the deeper as the crowd increases in size."

One cannot read the first five chapters without being depressed and asking, as the author did when a young psychiatrist, " What is sanity? " The answer given to him was that " sanity was a capacity for being dextrous in the matter of keeping out of insane asylums." The hopeful part of the book is found in the last four chapters and the " Prophecies." One is convinced of the need for mental hygiene before reaching the chapter which carries that title. Immediately following, " The Feasibility of Mental Hygiene " is discussed and then comes the long chapter on " Mental Hygiene Planning." Only a few points can be mentioned here. Mental hygiene has long insisted on the need for a reappraisal of the values of civilization. Material values need downward revision as the power they exert is greatly in excess of their cultural value and there is danger " that real cultures may be bludgeoned into insensibility by materialism "; " Environments will have to shift the frontiers of their realities "; that is, individuals must be given better opportunities of acquiring self-understanding and self-development with the result of becoming capable of inner sincerity.

The Foreword is illuminating. The book contains one of the series of The Salmon Lectures of the New York Academy of Medicine, and it is evident that the author not only had a profound devotion to Salmon personally, but that his professional life has been greatly influenced by association with Salmon. Of the many outstanding qualities which characterized Salmon the author remembers best " Salmon the humanitarian." Salmon had an unwavering faith in psychiatry—his " Cinderella of Medicine "—and gave the strength of both his body and mind unstintingly to this cause. The author feels sure that if Salmon were alive today he would be engaged in mobilizing psychiatric resources into some plan for repairing as far as possible the " wounds which have been inflicted upon a confused and disorganized society." He would use the tools at hand even if they were not as fine as he could have wished for.

We agree that this book needs to be read, and can be read, with advantage, by many classes of society. It is not easy reading, not a book to be taken up casually in a spare moment. It must be read, marked, learned, and inwardly digested to attain its full value.

We cannot close this inadequate review better than by quoting a prophecy: " The day will come when Salmon's Cinderella of Medicine, Psychiatry, will be honored as a wise and bountiful Social Princess dispensing a largeness of culture. In the meantime, as a branch of medicine and one of the subdivisions of biology, Psychiatry is busily engaged in utilizing a variety of scientific methods and through its handmaiden Mental Hygiene is fulfilling the duty of diffusing ' the knowledge that it gains ' and availing itself of the privilege as far as it is able of contributing ' to the lessening of human sufferings and the enhancement of human joys.' "

MAZŸCK P. RAVENEL

Your Marriage Problem — *By Norman E. Himes. New York: Farrar & Rinehart,* 1940. 434 pp. Price, $3.75.

Mixing sociology and sex is not new, nor are economics and marriage strangers, but until now we have had

no such attempt as this to describe and analyze the chief factors and the rôles they play for and against enduring happiness within social traditions of life.

Without superfluous detail, the embroidery of emotion, or partisanship of propaganda, the author assembles many of the best contributions of sociology and medicine of the past thirty years which offer facts and opinions worthy of attention by persons interested in marriage as it is approached, completed, and enjoyed by the post-war generation.

The author expresses his optimistic belief in the value of information and its understanding by youth as the best guarantees against the mistakes of their elders.

He has learned problems of the marriageable and the married from the experience of a "marriage counsellor," and while not as facile and sure in some of his medical discussions as in those of sociologic and economic importance he nevertheless expresses the essentials in each field with adequacy.

The reader is spared the usual doses of anatomy and physiology, and there is no offensive emphasis upon the commonly overemphasized psychology of sex. The uniqueness of the volume consists rather in the association of topics commonly dealt with in separate books and rarely discussed intimately and seriously by the wooing and the early wedded.

The buying, building, or renting a home, working of wives, budgeting, credit needs and uses, insurance, investment, come along cheek by jowl with problems of sterility, contraception, and child adoption, each in relation to the main purpose of scoring high in married happiness.

The references are abundant and well chosen, the index is adequate in topics and detail and the bookmaking good though not superior.

Professor Himes has given us not so much a piece of literature as a useful textbook for the convenience of the steadily expanding army of men and women who would listen and learn before and after the leap into marriage, and for those who serve as professional counsellors in the medical, social, economic, legal, and psychological problems of those who would live together permanently and happily.

If happiness in marriage can evolve out of the methodologies of the modern sociologist, this book may prove useful for that end. HAVEN EMERSON

The Way Life Begins—An Introduction to Sex Education—*By Bertha Chapman Cady and Vernon Mosher Cady (rev. ed.). New York: American Social Hygiene Association,* 1939. 80 pp. Price, $1.50.

The usefulness of this little book is proved by its frequent printings since 1917 and the wide popularity it has enjoyed. This edition, thoroughly revised and put out in attractive covers, with a number of full page colored plates, should continue its educational mission in providing parents and teachers, boys and girls with authentic information on sex education from the standpoint of nature study in plants and animals, leading up by gradual steps to the reproductive functions in man and woman. It affords a logical approach to the wider field of social hygiene in which the American Social Hygiene Association has been active and effective for over 25 years.

RICHARD A. BOLT

Water Supply and Sewerage—*By Ernest W. Steel. New York: McGraw-Hill,* 1938. 653 pp. Price, $5.00.

The author states this book is an attempt to present, for engineering students, those essentials of principles and present-day practice necessary to solution of the problems of water sup-

ply and sewerage. There are thirty chapters, as follows: Introduction, 7 pp.; Quantity of Water and Sewage, 20 pp.; Rainfall and Run-off, 29 pp.; Ground Water, 27 pp.; Conveyance of Water-Materials Used, 36 pp.; Conweyance of Water—Collection and Distribution, 40 pp.; Pumps and Pumping Stations, 44 pp.; Quality of Water Supplies, 32 pp.; Self-purification of Streams, 11 pp.; Treatment of Water—Sedimentation and Coagulation, 25 pp.; Treatment of Water—the Rapid Sand Filter, 24 pp.; Treatment of Water—the Slow Sand Filter, 8 pp.; Miscellaneous Water Treatment Methods, 26 pp.; Sewerage—Definitions and General Considerations, 5 pp.; Amount of Storm Sewage, 12 pp.; Sewer Pipes, 23 pp.; Flow in Sewers, 14 pp.; Sewer Appurtenances, 24 pp.; Design of Sewer Systems, 17 pp.; Sewer Construction, 20 pp.; Maintenance of Sewers, 7 pp.; Characteristics of Sewage, 19 pp.; Sewage Disposal, 14 pp.; Screens and Skimming Tanks, 10 pp.; Sedimentation of Sewage, 26 pp.; Sewage Filtration, 36 pp.; Activated Sludge, 18 pp.; Sludge Treatment and Disposal, 21 pp.; Miscellaneous Sewage Treatment Problems, 13 pp.; Financing and Management, 13 pp.; 2 Appendices and Index, 31 pp.

The book is well arranged and covers a wide field concisely for the purpose of general instruction. For health officers and others desirous of a general view of the field, the book should prove useful and informative.

LANGDON PEARSE

BOOKS RECEIVED

PROGRESS IN MEDICINE. Describing the Major Developments During the Past Hundred Years. By Iago Galdston. New York: Knopf, 1940. 347 pp. Price, $3.00.

THE STREPTOCOCCI. THEIR DESCRIPTIONS, CLASSIFICATION, AND DISTRIBUTION, WITH SPECIAL REFERENCE TO THOSE IN MILK. By William D. Frost and Mildred A. Engelbrecht. Madison, Wis.: Willdof Book Co., 1940. 171 pp. Price, $4.25.

CHILD CARE AND TRAINING. By Marion L. Faegre and John E. Anderson. 5th ed. revised. Minneapolis: University of Minnesota Press, 1940. 320 pp. Price, $2.50.

PSYCHOTHERAPY. By Lewellys F. Barker. New York: Appleton-Century, 1940. 218 pp. Price, $2.00.

HANDBOOK OF MATHEMATICAL TABLES AND FORMULAS. Compiled by Richard Stevens Burington. Sandusky, O.: Handbook Publishers, 1940. 275 pp. Price, $1.25.

FIRST AID TO INJURED AND SICK. By J. F. Sutherland. Philadelphia: Peter Reilly Co., 1940. 77 pp. Price, $.25.

THIS DYNASTY OF DOCTORS. By Rhoda Truax. Indianapolis: Bobbs Merrill, 1940. 397 pp. Price, $2.50.

OFFICIAL AND TENTATIVE METHODS OF ANALYSIS. Association of Official and Agricultural Chemists, Washington, D. C., 1940. 5th ed. 757 pp. Price, $5.00.

FOOD, NUTRITION AND HEALTH. By E. V. McCollum and J. Ernestine Becker. 5th ed. Published by the Authors, Baltimore, Md., 1940. 127 pp. Price, $1.50.

COMMUNITY HYGIENE. By Elizabeth Sterling Soule and Christine Mackenzie. Macmillan: New York, 1940. 218 pp. Price, $1.75.

HEALTH ACTIVITIES AND PROBLEMS. An Experience Workbook for the Secondary School Student. By D. Oberteuffer and P. C. Bechtel. New York: Houghton Mifflin, 1940. 147 pp. Price, $.60.

PROCEEDINGS OF THE DENTAL CENTENARY CELEBRATION, BALTIMORE, MD., MARCH 18, 19 AND 20, 1940. George M. Anderson, Editor. Publication Committee, Medical Arts Building, Baltimore, Md. Edition limited.

ELEMENTARY BACTERIOLOGY. History, Fundamentals, Pathogenic and Non-pathogenic. By Joseph E. Greaves and Ethelyn P. Greaves. 4th ed. Philadelphia: Saunders, 1940. 587 pp. Price, $3.50.

FUNDAMENTALS OF BACTERIOLOGY. By Martin Frobisher. 2d ed. Philadelphia: Saunders, 1940. 653 pp. Price, $4.00.

SAGINAW COUNTY DEPARTMENT OF HEALTH—Annual Report, 1939. Saginaw, Mich.: Department of Health, 1940. 57 pp.

YOUR HEALTH: A Guide to the Medicine and Public Health Building, New York World's Fair, 1940. New York: American Museum of Health, 1940. 96 pp.

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH.D.

Pro BCG—Unqualified support for BCG Vaccination is urged for babies born in households in which tuberculous patients reside, as the best possible protection. BCG is safe and confers immunity lasting two or more years says this Canadian proponent.

BAUDOIN, J. A. Vaccination against Tuberculosis with BCG Vaccine. Canad. Pub. Health J. 31, 8:362 (Aug.), 1940.

Still Our First Job—Declines in tuberculosis rates are due to a general lessening of infection. Among the tuberculous the death toll is still appalling. About half the infected individuals develop clinical tuberculosis, and from 10 to 20 per cent eventually die of the disease. Preventing infection remains the most pressing problem.

BOGEN, E. The Toll of Tuberculosis Infection. Am. Rev. Tuberc. *42, 2:253* (Aug.), 1940.

For Your Own Information—A carefully controlled study of heat-killed bacterial vaccine for the common cold made in a group of cold-susceptible students reveals that it is of no value.

DIEHL, H. S., *et al.* Cold Vaccines. J.A.M.A. 115, 8:593 (Aug. 24), 1940.

More and Better Public Hygiene—Briefly presented are some of the more numerous opportunities for effective life work in the public health field, and the need for adequate training to prepare for them.

DIEHL, H. S. Medical Careers in Public Health. J.A.M.A. 115, 5:343 (Aug. 3), 1940.

Despite Our Vaunted Sanitation—Probably there are 5 to 10 times as many outbreaks of disease due to faulty sanitation as ever get into the reports. New York State which has better than average sanitary supervision furnishes most of the reports even though it contains but a tenth of the total national population. If we knew how great a penalty we paid for our inadequate sanitary safeguards we might be more willing to improve them.

FRANK, L. C. Disease Outbreaks Resulting from Faulty Environmental Sanitation. Pub. Health Rep. *55, 31:1373 (Aug. 2), 1940.*

Better Parents—A journal of heredity seems an unlikely spot in which to find a brief philosophic article on parenthood, but here it is. Less algebra and more physiology is urged upon our educators.

KOSMAK, G. W. The Responsibility of Parenthood. J. Heredity. 31, 6:297 (June), 1940.

The Great Social Adventure—Forty per cent of entering school children need more careful examination than they get in ordinary classroom observation, and children should be "readied" for first grade. How more of their emotional kinks might be unravelled is the theme of a preceding editorial.

LOWREY, L. G. Readiness for School. Understanding the Child. 9, 2:4 (June), 1940.

Personal Note—Freshly prepared vanishing cream containing an oxidizing agent, such as sodium perborate, rubbed into the exposed skin will protect against ivy poisoning. Directions for applying are given.

SCHWARTZ, L., *et al.* Protective Ointment for the Prevention of Poison Ivy Dermatitis. Pub. Health Rep. *55, 30:1327* (July 26), 1940.

Healthy Teeth—In this study of Forsythe Dental Infirmary children aged 4 to 13 years, it is found that those largely free from dental caries have better present and past health standards than those who enjoy high frequency of dental caries. Oral conditions may be regarded as symptomatic of the general health of the whole body.

SOGNNAES, R. F., and WHITE, R. L. Oral Conditions of Children in Relation to State of General Health and Habits of Life. Am. J. Dis. Child. 60, 2:283 (Aug.), 1940.

Making Communities Better and Safer Living Places—Some of the problems incident to the integration of a mental hygiene service in the existing community social agencies are analyzed, and the most promising procedures are suggested. A timely and important paper.

STEVENSON, G. S. Ways of Developing and Utilizing Psychiatry in Community Health and Welfare Programs. Ment. Hyg. 24, 3:353 (July), 1940.

Sweets vs. Teeth—Notable for coining the doubtful phrase "an unsweetened tooth will not decay," this radio talk tells about the now well known findings of the several Eskimo dental surveys in which the Eskimos living on a protein diet had perfect teeth while those who had access to store foods—including sugar, molasses, candy, etc.—had teeth as bad as their white neighbors.

WAUGH, L. M. An Unsweetened Tooth Cannot Decay! J. Am. Dental Assn. 27, 7:1124 (July), 1940.

Paradox—General trends of tuberculosis rates depend upon the nutrition of the bulk of the people and upon the sanitary and economic status of the nation. As national nutrition is lower in the predominently agricultural countries the tuberculosis mortality is higher there than in industrial states.

WOLFF, G. Tuberculosis Mortality and Industrialization. Am. Rev. Tuberc. 42, 1:1 (July), 1940.

For Better Rabies Vaccines—Only a limited number of antirabic vaccines are capable of immunizing mice against rabies. Much of the vaccine being sold has little antigenic value. A mouse test is urged for each batch as one method of bettering the situation.

WYCHOFF, R. W. G., and BECK, C. E. The Potency of Antirabic Vaccines. J. Immunol. 39, 1:17 (July), 1940.

ASSOCIATION NEWS

APPLICANTS FOR MEMBERSHIP

The following individuals have applied for membership in the Association. They have requested affiliation with the sections indicated.

Health Officers Section

Albert L. Berndt, M.D., 1304 Gallia St., Portsmouth, Ohio, Health Commissioner

Bertram P. Brown, M.D., 703 California State Bldg., Los Angeles, Calif., Director, State Dept. of Health

Frederick B. Dart, M.D., 61 Main St., Niantic, Conn., Health Officer, Town of East Lyme

Hugh L. Dwyer, M.D., Dr.P.H., City Hall, Kansas City, Mo., Director of Health

Eldon L. Eagles, M.D., D.P.H., P. O. Box 120, Windsor, Nova Scotia, Can., Divisional Medical Health Officer, Dept. of Public Health

Lewis Fine, M.D., Hawesville, Ky., Health Officer, Hancock County Board of Health

Robert J. Lamb, M.D., Franklin & Gulf County Health Unit, Apalachicola, Fla., Director

Hidetoshi Shiga, M.D., Ph.D., M.P.H., Tokyo Health Center, 23 Akashicho, Kyobashi, Tokyo, Japan, Municipal Health Officer

Martha Tracy, M.D., Dr.P.H., 516 W. Coulter St., Philadelphia, Pa., Assistant Director of Public Health

Bruce Underwood, M.D., Morganfield, Ky., County Health Officer

H. H. Williams, M.D., 604 U. B. Annex, Dayton, Ohio, Health Commissioner

H. Maceo Williams, M.D., M.P.H., 201 N. Cary St., Baltimore, Md., Administrative Health Officer, City Health Dept.

Arthur Wilson, M.D., C.P.H., Health Dept., Saskatoon, Sask., Can., Medical Officer of Health

Laboratory Section

Mary Branston, A.B., 213 Hubbell St., Houghton, Mich., Laboratory Bacteriologist "A," State Dept. of Health

Katherine Chase, M.S., 36 Dennis Ave., S.E., Grand Rapids, Mich., Bacteriologist, State Dept. of Health

Margaret R. Holley, B.A., B.S. in Ch., 403 Agate St., Houghton, Mich., Junior Serologist, State Dept. of Health

Mary E. Joy, B.S., 314 Memphis St., Lansing, Mich., Bacteriologist, State Dept. of Health

Murl B. Kurtz, D.V.M., Michigan Dept. of Health Laboratory, Lansing, Mich., Senior Serologist

John R. Pate, M.D., State Dept. of Health, 620 S. 3rd St., Louisville, Ky., Director, Serological Laboratory

John J. Perkins, B.A., American Instrument Co., Silver Spring, Md., Biological Chemist

Janet H. M. Suchman, M.S., 515 W. 168th St., New York, N. Y., Student, DeLamar Institute of Public Health

Vital Statistics Section

William B. Borden, M.D., Dr.P.H., Fort Snelling, Minn., Post Surgeon and CCC District Surgeon

George C. Braidwood, 1037½ Poxson Ave., Lansing, Mich., Field Representative, Bureau of Records & Statistics, State Dept. of Health

John W. Fertig, Ph.D., 600 West 168th St., New York, N. Y., Professor of Biostatistics, DeLamar Institute of Public Health

Robert D. Grove, Ph.D., Room 4802, Commerce Bldg., Washington, D. C., Associate Social Science Analyst, Division of Vital Statistics, Census Bureau

George A. Huggins, B.S., 1025 Witherspoon Bldg., Philadelphia, Pa., Actuary, Colonial Life Insurance Company of America

Robert F. Lenhart, M.S., 502 Glebe Road, Apt. 1, Arlington, Va., Acting Chief, Field Section, Division of Vital Statistics, Census Bureau

Sylvia L. Parker, Ph.D., 333 East 43rd St., New York, N. Y., Senior Statistician, Dept. of Health

Marcelino Martínez Pascua, M.D., M.B., 615 N. Wolfe St., Baltimore, Md., Fellow, Johns Hopkins School of Hygiene and Public Health

Perry O. Powell, 161 W. Wisconsin Ave., Milwaukee, Wis., Executive Secretary, National Funeral Directors Assn.

Barkev S. Sanders, Ph.D., LL.B., 4620 Morgan Drive, Chevy Chase, Md., Chief, Division of Health & Disability Studies, Social Security Board

Grace C. Scholz, B.A., 4420 50th St., N.W., Washington, D. C., Chief, Mental Institutions Unit, Census Bureau

Emile Alfred A. Schori, 2019 Hyperion Ave., Los Angeles, Calif., Director, Division of General Statistics, City Health Dept.

Lelia Hughes Wilson, 636 St. Philip St., New Orleans, La., Office Supervisor, Bureau of Vital Statistics, State Board of Health

Engineering Section

Bynum A. Buff, Rutherfordton, N. C., Sanitary Officer, Rutherford-Polk District Health Dept.

Arthur D. Caster, 1537 "A" Ave., New Castle, Ind., Superintendent, Sewage Treatment Works

Sidney F. Dommes, Jr., B.S., 240 5th St., Richmond, Calif., Assistant Sanitary Engineer, State Dept. of Health

Alvin W. Green, B.S., Department of Health, Peoria, Ill., Public Health Engineer

Hubert S. Post, A.B., 230 Blue Lakes N., Twin Falls, Ida., Sanitarian, South Central Health Unit

Peter G. Stevenson, M.S.P.H., Mason-Manistee Health Dept., Manistee, Mich., Sanitarian

Industrial Hygiene Section

James Hervi Sterner, M.D., Laboratory of Industrial Medicine, Kodak Park, Rochester, N. Y., In charge of Laboratory, Eastman Kodak Company

Food and Nutrition Section

Theodore F. Pappe, A.B., 415 Federal Bldg., Buffalo, N. Y., Chief, Buffalo Station, U. S. Food and Drug Administration

Maternal and Child Health Section

Edith M. Budlong, R.N., 39 Oswald St., Pawtucket, R. I., Supervising Maternal and Child Health Nurse, State Dept. of Health

Oma Creech, M.D., M.P.H., 620 South 3rd St., Louisville, Ky., Associate Director, Division of Maternal and Child Health, State Dept. of Health

Viva H. Gordon, M.D., State Dept. of Health, Lansing, Mich., Associate Director, Bureau of Maternal and Child Health

Marguerite C. Horgan, R.N., Crippled Children's Division, State Office Bldg., Providence, R. I., Supervisor

Helen Haslett Owen, M.D., 150 Western Ave., Altamont, N. Y., Assistant Director, Division of Maternity, Infancy and Child Hygiene, State Dept. of Health

Delmar B. Roseberry, M.A., 150 East 45th St., New York, N. Y., Director, Medical Dept., Children's Aid Society

Viola Russell, M.D., State Dept. of Health, Bismarck, N. D., Director, Maternal and Child Health Division

Public Health Education Section

Elizabeth D. Bolles, c/o Queen's Hospital, Honolulu, T.H., Executive Secretary, Hawaii Territorial Medical Assn. and Honolulu County Medical Society

Frank J. Hill, M.D., M.P.H., 549 Fairview Ave., Manistee, Mich., Health Director, Mason-Manistee-Benzie Health District

Arthur L. Kaslow, M.D., Box 3006, Stanford University, Calif., Instructor in Hygiene, Dept. of Hygiene

Public Health Nursing Section

Ruth Albrecht, B.S., State Health Dept., Austin, Tex., Consultant in Nurse Education

Rowena Belden, 1 Frederick St., Hartford, Conn., Public Health Nurse, Bureau of Venereal Diseases, State Dept. of Health

Irene M. Donovan, R.N., Box 65, Bismarck, N. D., State Supervisor of Public Health Nursing, State Dept. of Public Health

Theodosia W. Flud, R.N., Box 470, Fayetteville, N. C., Supervising Nurse, City-County Health Dept.

Norma A. Michaelson, B.S., 200 E. Laurel, Fort Collins, Colo., Lorimer County Public Health Nurse

Dorothy E. Nehrkorn, R.N., B.S., 325 E. Broadway, East St. Louis, Ill., Chief Supervising Nurse, East Side Health District

Luella Olson, R.N., Touro Infirmary, New Orleans, La., Public Health Instructor for Student Nurses

Florence L. Phenix, R.N., Room 146, N. State Capitol, Madison, Wis., Supervisor, Crippled Children's Division, Bureau for Handicapped Children, State Dept. of Public Instruction

Epidemiology Section

Frederick G. Gillick, M.D., Room 18, Municipal Courts Bldg., St. Louis, Mo., Supervisor, Venereal Disease Control Section, Health Division

John A. Lewis, Jr., M.D., M.P.H., 2141 Baringer Ave., Louisville, Ky., Acting Director, Bureau of Venereal Diseases, State Dept. of Health

Fred G. Pegg, M.D., R.F.D. 5, Winston-

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Experienced physician, graduate University of Illinois; M.P.H., Johns Hopkins, 1940; seeks administrative opening suitable to his proven ability. Excellent references. **A466**

Physician, M.P.H., Harvard, a student of maternal problems, wishes position preferably with teaching opportunities. **A461**

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Physician, aged 40; M.D. and Dr.P.H., Yale University; with excellent training in medicine, pediatrics, and epidemiology; now specializing in public health education; will consider appointment in health education or administration. **A366**

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Experienced bacteriologist, young man

Salem, N. C., Venereal Disease Control Officer, Forsyth-Yadkin-Davie-Stokes County Health Dept.

Ira Leo Schamberg, M.D., Dept. of Dermatology & Syphilology, Univ. of Michigan, Ann Arbor, Mich., Research Associate in Syphilis, Univ. of Michigan Medical School

Benjamin Viel, M.D., 38 Seminario, Santiago, Chile, S. A., Epidemiologist, Public Health Service of Chile

Unaffiliated

Gladys P. Bell, A.B., P. O. Box 743, Boise, Ida., Medical Social Worker, Idaho Division of Public Health

James A. McVeigh, M.D., 3919 John R, Detroit, Mich., Diagnostician, Detroit Dept. of Health

Victor H. Vogel, M.D., U. S. Public Health Service, Washington, D. C., Consultant to States in Mental Hygiene

PROPOSED EIGHTH EDITION OF STANDARD METHODS FOR THE EXAMINATION OF DAIRY PRODUCTS

ALTHOUGH the seventh edition of this report was published in 1939 it is proposed to publish a new edition in 1941, when the present printing of the seventh edition will be exhausted. The primary purpose of the publication of a new edition is to make it possible to include the newly prepared sections covering methods for the examination of frozen desserts. This publication will also permit the introduction of various improvements in the technics for examination of milk and cream that have been tested during the period since 1939.

Mimeographed copies of the proposed methods for the microbiological examination of frozen desserts, including such ingredients as powdered milk, evaporated milk, condensed milk, gelatin, coloring solutions, flavoring extracts, nuts, fruits, sweetening agents, and egg products were distributed by the Committee on Methods for the Examination of Frozen Desserts to all who requested them in 1939. These manuscripts have been revised in the light of criticisms received during the current year, and are ready for presentation for approval at the Detroit meeting of the Association.

The Committee on Methods for the Examination of Dairy Products will, at the same time, ask that the incubation of agar plates at 32° C. (tolerance ± 1.5° C.) be made optional, thereby giving the approval of the Association to Departments of Health that have found it feasible and practical to introduce not only the new standard agar, but also 32° C. incubation. The directions for methods used for determining the sterility of bottles, cans, and other dairy utensils have been developed by W. von D. Tiedeman as *Referee,* into a separate section of the report. While there are no real changes in methods, directions have been prepared for examining paper milk containers, sanitary closures and bottle caps, ice cream freezers, and other equipment used in handling milk, cream, butter, and frozen desserts and their ingredients. Minor changes in other methods such as the application of the coliform technic to dairy products other than milk and cream, sediment testing, etc., will also be presented for approval at the Detroit Meeting.

Committee on Methods for the Examination of Frozen Desserts

F. LEE MICKLE, *Chairman*

Committee on Methods for the Examination of Dairy Products

ROBERT S. BREED, *Chairman*

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Experienced bacteriologist, young man

of 33, Sc.B., who for several years has been in charge of state laboratory doing public health and diagnostic bacteriology, immunology and serology, will consider opening. L427

SANITARY ENGINEERING

Engineer, aged 38, 3 years' experience as district sanitation supervisor, state department of health, together with work on plumbing, heating and ventilation, will consider position in the plumbing and heating field or state department of health. Prefers middle western or western states. E453

Public health engineer, B.S. in Sanitary Engineering from Massachusetts Institute of Technology; experienced in Massachusetts, Connecticut and Kentucky, seeks position as sanitary or public health engineer with health department. E380

Engineer with good training and experience in water treatment, sewage plant operation and in research, wishes position as superintendent. Can go anywhere. E422

Public health engineering position desired by man with M.S. in Sanitary Engineering from Harvard, and 7 years' experience, including 4 years with state department as assistant engineer. E468

MATERNAL AND CHILD HEALTH

Physician, M.D., Class A medical school; training in obstetrics and public health; experienced as director of county health department; teacher of clinical obstetrics and administrator of state maternal and child health program; desires position in public health obstetrics or in maternal and child health administration. C417

Woman physician, with excellent medical training and background of public health nursing experience, seeks position in maternity and infancy work. C376

Government Seeks Part-Time Medical Officers

THE expansion of the Army creates a need for about 600 civilian medical officers in various grades for temporary and part-time service. The duties of full-time officers will be to act as doctors of medicine in active practice in hospitals, in dispensaries, and in the field. The duty of part-time officers will be to report for sick call at a fixed hour each day and to be subject to emergency call at all times.

The United States Civil Service Commission, in making this announcement, calls particular attention to the fact that part-time officers will be able to continue their regular practice. In order that this may be done, appointments to the part-time positions will be made of medical officers in the vicinity of the place of duty.

Information concerning these positions may be obtained from the Secretary of the Board of United States Civil Service Examiners at any first- or second-class post office, or from the United States Civil Service Commission, Washington, D. C. Physicians are urged to apply at once. This work is of the greatest importance to the success of the national defense program.

Advertisement

Opportunities Available

ASSISTANT DIRECTOR—Department of public health in university medical school; physician with Master's or Doctor's degree in Public Health required; experience should have included administrative work in health department; some teaching; about $4,000. PH10-1, Medical Bureau, Palmolive Building, Chicago.

PUBLIC HEALTH PHYSICIANS—(a) To serve as county health physician in rural section of South; public health training available with all expenses paid to men interested in this field; salary upon appointment as county commissioner of health, $3,000, plus $600 travel allowance. (b) City health physician; western city having well established department of health adequately staffed; $3,600, plus $300 travel allowance. (c) City health physician; midwestern metropolis; no administrative work involved; $2,700. (d) Physician to direct venereal disease clinic, southern metropolis; initial stipend $3,600. PH10-2, Medical Bureau, Palmolive Building, Chicago.

STUDENT HEALTH PHYSICIANS—(a) Western college with enrollment of over 4,000 students; student health experience not required; recent graduate eligible. (b) To assist director of student health service, midwestern university; $3,000 for college year of nine months, increasing to $3,500. PH10-3 Medical Bureau, Palmolive Building, Chicago.

PUBLIC HEALTH NURSES—(a) Important supervisory position, city-county health department; nursing staff is amalgamation of visiting nurse association and city-county health department; healthful climate; beautiful location; population largely American; year of theory and public health nursing required; $175; adequate travel budget. (b) Supervisor county health department; minimum of fifteen credits in advanced public health training required; duties consist of assisting in local health program and participating in maternity and child health program; midwest. (c) One supervisor and two public health nurses; state department of health; supervisor must have speaking ability and be able to supervise eight nurses; midwest. (d) For tuberculosis educational program, midwest. PH10-4, Medical Bureau, Palmolive Building, Chicago.

HEALTH EDUCATION DIRECTOR — College graduate who has majored in public health and whose experience has included educational work; duties will be in connection with well established county tuberculosis society; $1,620, plus car allowance, increasing annually; 41 hour week; East. PH10-5, Medical Bureau, Palmolive Building, Chicago.

SCHOOL NURSE—Public health training required; $1,300, car allowance; vicinity Detroit. PH10-6, Medical Bureau, Palmolive Building, Chicago.

STUDENT COUNSELOR—Unique opening for personable young woman with college and nursing degrees; exclusive school for young women; South. PH10-7, Medical Bureau, Palmolive Building, Chicago.

BACTERIOLOGISTS—(a) Research appointment in state department of public health; Ph.D. or D.Sc. in one of the biologic sciences required; $3,000. (b) Instructorship in southern university; must be qualified to conduct laboratory sections in general bacteriology and teach a course in laboratory diagnosis; $1,600 plus $350 for summer session work, if desired. (c) Young bacteriologist for appointment in laborato[illegible] surgical bacteriology; midweste[illegible] For teaching assistantship in [illegible] opportunity for advanced study and research in bacteriology; some teaching experience desirable; annual allowance of about $500. PH10-8, Medical Bureau, Palmolive Building, Chicago.

Positions Wanted

PUBLIC HEALTH PHYSICIAN—Well trained and experienced public health physician is available; B.S., M.D., midwestern university; C.P.H., Johns Hopkins; 10 years in public health administration; past several years, state director, division of venereal disease control; for further information please write M. Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago.

PUBLIC HEALTH NURSE—Excellently trained public health nurse is available; A.B. degree, eastern college; graduate of school of nursing of university hospital; year's postgraduate training in public health nursing; is certified; nearly 15 years' executive experience in public health nursing; past several years, executive secretary, city health council; a very superior woman of broad and varied experience; has made distinct contribution to field of public health nursing; for further information please write M. Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago.

PUBLIC HEALTH NURSE—Will receive degree of B.S. in public health nursing from large university in December; 2 years' nursing experience during interim between graduation from university school of nursing and enrollment in public health course; for further information please write M. Burneice Larson, Medical Bureau, Palmolive Building, Chicago.

NEWS FROM THE FIELD

U. S. PUBLIC HEALTH SERVICE OFFERS MENTAL HYGIENE CONSULTATION SERVICE TO STATES

THE United States Public Health Service has established a new office, Mental Hygiene Consultant to the States, for the purpose of encouraging and giving aid in the organization of state mental hygiene programs. Mental health projects will be recognized as approved objects for expenditure of Title VI Social Security funds allocated to state health departments for the extension of public health work. Passed Assistant Surgeon Victor H. Vogel will be in charge of the office.

THE PUBLIC HEALTH ASSOCIATION OF NEW YORK CITY

THE first meeting of the Public Health Association of New York City for the 1940–41 season has been called for Tuesday, November 19, at 8:00 P.M., at the Russell Sage Building, 130 East 22 Street, New York.

Frank Kiernan, Secretary, announces that the session will center around "Echoes of the Annual Meeting of the American Public Health Association at Detroit." Dr. Arthur I. Blau, President of the Association, will preside. Speakers will include Dr. John L. Rice, Dr. Ira V. Hiscock, Dr. Helen C. Manzer, Sol Pincus, and Dr. Reginald M. Atwater.

The membership will be asked to vote on proposals to modify the By-laws so as to establish annual dues beginning with 1941. A further proposed revision of the By-laws, if adopted, will open the membership of the Association to all persons engaged in public health work in New York City and vicinity.

SOCIAL ASPECTS OF MEDICINE

A COURSE of six lectures on the social aspects of medicine will be given by Dr. C.-E. A. Winslow and Dr. Franz Goldmann of the Yale University School of Medicine at the New School for Social Research, New York City, beginning Thursday, October 3.

According to the announcement, Dr. Winslow will give the first and last lectures and that of October 17th. The course will examine the fundamental problem, the basic principles of social medicine, and the recommendation of the Committee on the Costs of Medical Care; it will discuss recent developments in the field and will outline a national health program.

DR. RENÉ SAND

ANY friends of DR. RENÉ SAND, Minister of Health in Belgium, will be glad to know that word has been received that he is safe in France.

It is also reported by DR. R. H. HAZEMANN, Provincial Health Officer for two areas near Paris, also well known in the United States, that much of the public health program is proceeding, especially an attack on alcoholism since the German occupation.

PERSONALS

Eastern States

LESLIE BAKER, who has been Director of Exhibits for the New York World's Fair, has been appointed Administrative Assistant on the executive staff of the new American Museum of Health to be opened in Flushing Meadow Park, New York City, next winter. Mr. Baker will be in charge of business affairs for the American

* Fellow A.P.H.A.
† Member A.P.H.A.

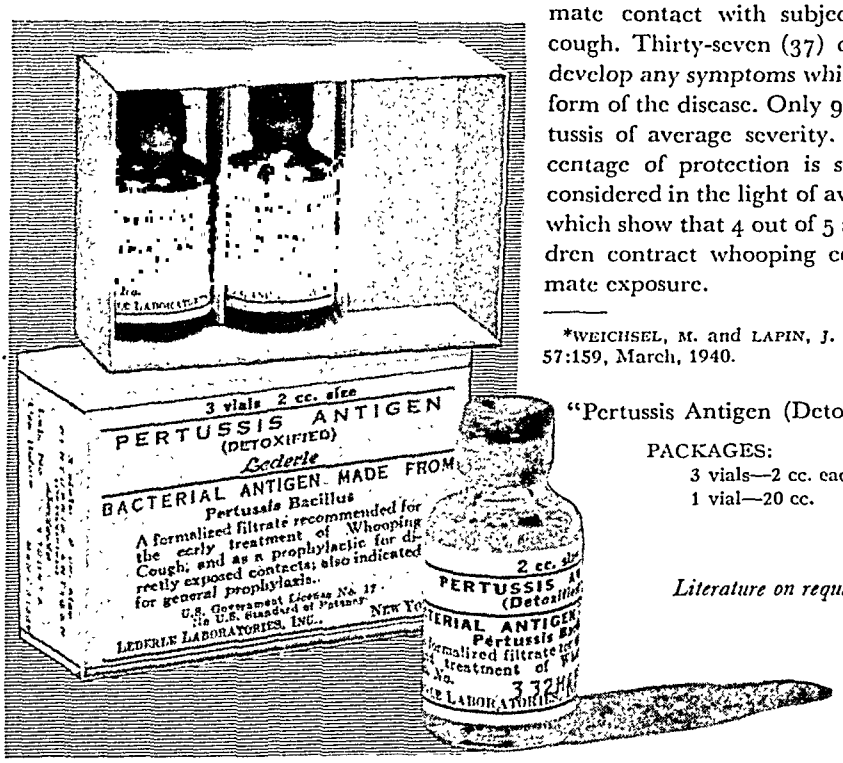
Prevention and treatment
of whooping cough with

PERTUSSIS ANTIGEN (Detoxified)

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THE EARLY TREATMENT of active cases of whooping cough with "Pertussis Antigen (Detoxified) *Lederle*" minimizes the dangers of the disease. The duration of the disease seems to be definitely shortened. The average number of paroxysms have been observed to be less than in non-treated cases and the incidence of complications is reduced.

When "Pertussis Antigen (Detoxified) *Lederle*" is used prophylactically in children intimately exposed to whooping cough, the immunological response is sufficiently rapid to prevent or modify the disease in a majority of cases. WEICHSEL* injected 57 children with 3 to 6 doses of "Pertussis Antigen (Detoxified) *Lederle*" after they had had intimate contact with subjects of whooping cough. Thirty-seven (37) children did not develop any symptoms while 11 had a mild form of the disease. Only 9 contracted pertussis of average severity. This high percentage of protection is significant when considered in the light of available statistics which show that 4 out of 5 susceptible children contract whooping cough after intimate exposure.



*WEICHSEL, M. and LAPIN, J. H., Arch. Pediat., 57:159, March, 1940.

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PACKAGES:
3 vials—2 cc. each
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Literature on request

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American Journal of Public Health
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and THE NATION'S HEALTH

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Public Health in National Defense*

W. S. LEATHERS, M.D., F.A.P.H.A.

Dean, and Professor of Preventive Medicine and Public Health, School of Medicine, Vanderbilt University, Nashville, Tenn.

THE American Public Health Association has devoted 69 years to the development of public health in America. Today this Association stands as a bulwark in support of those principles of government which guarantee to every citizen the inalienable right to a wholesome life, health, and normal productive capacity. Its membership is approximately 7,000, and its four standing committees on Eligibility, Research and Standards, Administrative Practice, and Professional Education have given strength and sound leadership to the emerging security of public health in our nation. Our official JOURNAL has been effective in the creation of new incentive, in the guidance of scientific thought, and in raising the level of performance in this inviting field of professional service. We must also continually appreciate the able and wise leadership which Dr. Reginald Atwater, our Executive Secretary, is giving to this Association.

Modern public health practice has developed in the past fifty years. The past decade is characterized by phenomenal progress, particularly in the expansion and stabilization of a nationwide program of public health. The people have been awakened as never before to their individual and collective responsibility in the protection of their health. The principle has been accepted that within natural limitations public health is purchasable, and the death rate of a community can be controlled. This has been done by safeguarding individual initiative and freedom of responsibility, or, expressed in the vernacular keynote, in the American way.

Many factors, social, economic, and political, have contributed to the remarkable results that have been obtained by the application of new knowledge and tried methods for the control of disease and the promotion of health. Probably at no time in our history has the average citizen felt more secure against death from disease. The conquests of disease and the increase in the expectancy of human life are cause for great satisfaction and encouragement. These inspiring gains are but a certain promise of even larger success in the future, and the results yet to be achieved should in some measure act

* Presidential Address delivered before the American Public Health Association at its Sixty-ninth Annual Meeting in Detroit, Mich., October 8, 1940.

as an antidote to the present world political insanity.

My theme today is not to sing a paean of praise on the control of human disease, suffering, and death, but I wish rather to discuss briefly some principles and measures which, to me, are of concern in maintaining the gains already made and in developing and stabilizing an adequate medical and public health program in national defense.

In a recent statement, Norman Davis said, "We must realize this: As long as we live this world will be an armed camp." All signs support this thesis and experience shows that our nation must be provided with the most modern and powerful weapons of defense, such as guns, battleships, aircraft, munitions, food, and man power. Our job is health preparedness for the mobilization of man power. This is the impelling need in the skillful and telling use of implements of modern warfare. The driving power and endurance of a nation depend upon the development and maintenance of the highest possible level of physical well-being and fitness. These are self-evident facts, but are set forth to stimulate public health preparedness through a long-time, dividend producing program for the conservation of human resources, not merely as a military need, but as a sound investment for better health in America.

During the past decade a series of epoch making events have occurred which have clarified our thinking and strengthened beforehand our purpose to develop a nation-wide program of public health. Here I wish to recount briefly some milestones of progress: In the first place a Committee of Fifty, 24 of whom were representative physicians, was organized to study the cost of medical care. In 1935, a new purpose was expressed in the passage by Congress of the Social Security Act. Another outstanding achievement was the National Health Survey in 1935–1936. Its findings are unmistakable indices of human needs in health preparedness.

A Committee of Four Hundred Physicians, incorporated, was voluntarily organized in 1937, and their "principles and proposals" were announced concerning public health and medical care. Then in July, 1938, the President's Interdepartmental and Technical Committees made their voluminous report at the National Health Conference. This was followed by a third called meeting of the House of Delegates of the American Medical Association in September, 1938. The Board of Trustees of that association formulated a platform of eight criteria in 1939 which has been published as a guiding influence, concerning health and medical care, in each issue of its *Journal*.

The Hospital Act of 1940, in essential details, was approved by the American Medical Association. This measure provided an experimental and demonstration procedure for building community hospitals where needed in coöperation with the federal government. This Act was passed unanimously by the upper house of Congress, but it has not been finally considered.

In a study of these reports and controversial measures, one point stands out—that we should continue to develop and properly maintain a nation-wide program of public health, and make available adequate medical care, particularly for the indigent and the low-income groups of our population. We are wholly conscious of the need, and our responsibility in behalf of one-third of the people who may be without the necessities of life—clothing, shelter, food, and medical care—and the corroding effect of this deficiency on health and national strength. These needs should be supplied in our social and political planning for total national defense. The record shows that approximately one-third of those examined for

service in the World War were physically unfit for military duty during one of the most critical periods in our country's history. This experience alone should cause us to make a dynamic drive for health preparedness.

The differences of opinion and even acrimonious discussions which have occurred among professional groups are probably conducive to a better understanding concerning immediate adjustments which must be made to the profound changes in an emerging social and economic order. All of us who have been engaged in practical public health appreciate fully the strength and leadership of the medical profession in the upbuilding of official health agencies; much credit is due thoughtful physicians for the results that have been accomplished. This partnership should be strengthened and continually maintained. The President of the American Medical Association, Dr. Van Etten, recently said that "a community that has no health program is culpably negligent and so are the physicians who permit such a failure." There was never a time when the need was more urgent than at present for a solid front in building up our medical and public health defense.

In a recent address, Dr. Parran wisely said:

> The preparedness of our man power for national safety is not controversial. Given a hand in the planning, all of us together, official and professional, can work out methods in which we all believe. There is no time for dogged adherence to outworn patterns or for a major change in proved forms of medical practice. Medical science grows, expands, opens up new possibilities for saving life and building strength. In the application of its basic sciences, medical practice must expand also to meet the new demands of the nation for self-preservation.

This statesman-like and forward-looking purpose is consistent with the great influence and real value of American medicine.

The first point in the new platform of the American Medical Association stresses the necessity for coördination of all medical and health functions of the federal government under one agency. In 1939, by Executive order, a step in this direction was taken by the creation of the Federal Security Agency, to which were transferred major divisions of health, welfare, and education. Unforunately, confusion still exists because other important administrative health divisions, exclusive of the Army and Navy, have not been placed under this agency. I am convinced that the federal-states relationship which has existed for 60 years and grants-in-aid for public health will be major factors in the expansion and stabilization of efficient full-time health service in coöperation with national voluntary health agencies and the medical profession. This is also desirable as a means of establishing and of maintaining minimal professional standards and financial equalization,

There has been marked progress in recent years in all state health departments. Special health activities have been projected because of grants-in-aid through the Social Security Act, which is proving a tremendous force in an effort to make health available for all. Probably the most dependable index of progress is the rapid advance made in the extension of full-time county and district health services. On January 1, 1936, there were only 996 full-time county and district health departments, and by June 30, 1939, there were 1,381, or an increase of approximately 40 per cent. Furthermore, during this 3 year period more than 5,000 persons—health officers, sanitary engineers, nurses, sanitation officers, and others — received training in public health. Thus the quality of personnel employed is continually emphasized and is being steadily improved.

One of the immediate problems con-

fronting this Association is to use its influence for the maintenance of efficient state and local health agencies as an essential military need. Coöperation in national defense is an obligation of every American citizen and the members of this Association have never shown a lack of patriotism and willingness to serve as needed in any great emergency. We have come to realize that there is no difference between the military and civil populations during a time of great stress.

Our experience during the World War showed that some of the communicable diseases are of prime importance in mobilization for military service. Some public health problems will also inevitably arise because of diversity of geographical conditions. Administrative practice must of necessity be adjusted to meet these variable factors.

Venereal diseases occupy first place among the disabling infections in our military forces. In the World War the record shows there were approximately 100,000 more new cases of syphilis and gonorrhea in our Army and Navy than there were wounds in battle. A complete account of the devastating effect of these infections in the civil population would present a gloomy and depressing picture. The Venereal Disease Act which was passed in May, 1938, is one of the three most important health measures enacted by Congress during the past decade. The appropriation made available for the year 1940 is $6,200,000. The discontinuance of the appropriation, $4,000,000, authorized by the Chamberlain-Kahn Act during the last war showed the utter futility and wastefulness of any sporadic effort for the ultimate control of infections which are so insidious and ubiquitous in their attack. No nation or state can afford to pursue a shortsighted policy in not providing adequate funds for a sustained fight against syphilis and gonorrhea. The results already obtained in increased number of treatment clinics, in improving serodiagnostic and case finding procedures, and in arousing universal interest and support are ample proof of the public demand to continue this program until venereal diseases become, like typhoid fever, a negligible health problem. This can be done if we have the will and the wisdom to do it.

The problem of tuberculosis is always accentuated during a period of great physical stress. The steady decline of morbidity and mortality from tuberculosis is well known. The most valuable element in the future program is increased emphasis on case finding procedures; the tuberculin test, and, especially, the x-ray examination of positive reactors and contacts in families and community groups. Early diagnosis and prompt follow-up by efficient public health nurse instruction are basic factors in the effective use of control measures. Collapse therapy has proved of great value in checking the spread of infection and quick relief of curable tuberculosis patients. All measures used for the control of tuberculosis must be continued in a more systematic, intensive, and technical way, especially in industrial communities and among the dependent groups of our population. This is the point of strategy in an advance attack on this still relatively prevalent infection. These facilities must become more readily and uniformly available.

You are familiar with the troublesome nature of measles and influenza during the last war and the frequency with which each of these was followed by pneumonia. Those of us who served during the decimating pandemic of influenza in 1918 and 1919 realize fully the failures of treatment and utter ineffectiveness of control measures. Available data point to the probability of another influenza pandemic in the near future, and there is urgent need for continued research and accumulative

experience in providing an effective immunizing substance.

The mortality from pneumonia was alarming during the last war, but new knowledge is now available for its prevention and cure. The discovery of sulfapyridine is the greatest boon to pneumonia therapy that has occurred in the present century. Campaigns against pneumonia are being conducted in 31 states and 2 territories. The bill recently introduced in Congress for control of "common colds, influenza, and pneumonia" authorizes, if passed, $3,000,000 for use in the respective states. This would make it possible to initiate a pneumonia control program on a nation-wide basis, and would make available better medical supervision, more technical aid, increase in number of typing stations, and a supply of sulfapyridine and sulfathiazole including specific sera. There is need for continued research to determine the relative value of specific serum and sulfapyridine in some of the 32 types of pneumonia organisms. This bill should be passed and the fund provided not only as an essential national defense measure but also as a great human need.

Unfortunately, we know little more about the control of meningitis than when it became a disease entity more than 100 years ago. However, there have been significant advances in diagnosis and treatment. The use of specific serum with sulfanilamide as an adjunct has been shown experimentally and by experience to be more effective than the use of either alone. There should be continued studies in the laboratory and in the field to provide a dependable immunizing agent.

The use of immunizing agents is basic in the mobilization of a large army and navy. The results obtained in the use of typhoid vaccine during previous wars are familiar. Recently a toxoid against tetanus has been developed, which is of proved value, and this should be made available for routine use. The continuance of vaccination against smallpox in the civil and military populations should be stressed. The constant threat of yellow fever in the southern region of the United States indicates the need for an ample supply of vaccine, not only for use here, but in the event of military service in tropical America.

During the last war an antimalaria zone one mile in width was created around each cantonment in the southern region, and antimalaria measures were applied intensively under the direct supervision of a representative of the U. S. Public Health Service in coöperation with state and local health departments. Fortunately, even better methods of malaria control are now known, but there are serious limitations in regard to therapy. There is urgent need for a synthetic preparation as a true prophylactic against malaria.

The protective measures of general sanitation around army camps and cantonments can be greatly facilitated by thorough coördination between the state and local health agencies and the military population. Well prepared and experienced sanitation officers are required in the enforcement of regulations, in providing a pure water supply, in the proper supervision of milk, and in the safe disposal of sewage. A careful inspection of food supplies to prevent contamination, and general cleanliness of the vicinity in coöperation with the officials of military camps must be strictly enforced.

Recently a high naval officer made the comment that our Navy is no stronger than the number of men it can float off, and that his interest is in the health of workers in industry. Air power is also an industrial problem. Experienced aviators tell us that air power may be best measured in terms of industrial development. Obviously, a program of national defense cannot with sanity disregard the problems of health

in industry. There is much to be accomplished in controlling excessive occupational morbidity and mortality rates. During a period of national emergency industry will be working under high pressure; many hazardous chemicals will be used; overcrowding will occur, and poor housing and sanitary conditions may become acute problems. This situation will require constant vigilance on the part of public health workers, and especially of industrial physicians. The Division of Industrial Hygiene of the National Institute of Health with its highly trained workers and facilities sustains close relationships with industry, labor, and health agencies, and is in a position to coördinate a national program of industrial health, including laboratory and field research.

It may be well to stress that the advances in public health are the outcome of knowledge acquired through research in the physical, social, and biological sciences, and, therefore, it is imperative that enlarged facilities and increased financial support be provided. This is especially necessary because most of the research laboratories of European countries are at a standstill or closed except for military purposes, and this places a greater responsibility upon America for continued and increasing research activities in the pure and the applied sciences.

The problems of military and industrial mobilization involve the migrations and readjustments of millions of people. This will cause deep-seated disturbances of family and community life. There will be also serious economic problems as an inevitable sequence of war, and as a consequence universal anxiety and physical stress of hundreds of thousands of people. These factors loom up for thought and balanced judgment in all our planning for medical and health preparedness. We have a tremendous task ahead of us.

Another problem of major significance is that of nutrition. The new science of nutrition may profoundly affect the economic and social structure of future civilization. We know now that much ill health, physical disability, disease, and incapacity which have heretofore been poorly understood and regarded as inevitable are caused by faulty diet and are preventable. The knowledge gained in the laboratory and clinic must be applied as soon as possible to the general population. If our nutritional requirements are pushed to the background during a period of emergency, disastrous results are inescapable. The present war is a "war of nerves" and the issue may well depend upon whether or not the people are able to withstand the physical and mental strain to which they may be subjected. The nutritional status of the nation's population will certainly be a determining factor.

Since the lives of children are of primary concern to the nation even when no emergency exists, and because children are the greatest sufferers in times of stress and emergency, plans for safeguarding their welfare must have a prominent place in national defense. Serious dislocations of family life will be inevitable and will require that ample provision be made for increased medical, nutritional, and welfare services for children in all communities.

One other problem should be emphasized, and that is to accentuate the effort which is being made by state health agencies to provide qualified personnel by a merit system. There are two age-old questions which concern each person who thinks of public health as a professional career. One is the opportunity for continuous service—security in tenure of office—and the other is a reasonable income. Both the health department merit system and the general civil service system should be developed so as to provide security as to tenure of position, retirement benefits, salary scale and promotions, ap-

pointment of qualified personnel, and freedom from undesirable political interference. These are matters of great moment in securing and, particularly, in retaining qualified personnel by official health agencies.

Obviously, it is not possible to discuss fully public health preparedness in national defense, but these comments may serve to direct our energies. There is definite need to coördinate and unify our efforts in evolving an adequate program of public health in total national defense in the present emergency. There is also perhaps an even greater need to look byond the present emergency to the period of recovery from the horrors of war. There is an old Irish saying that "man is twenty years a-growing, twenty years in blossom, and twenty years declining." The opportunity exists today, with knowledge already available, to extend the 20 years in blossom to 30 or perhaps to 40 years. It would not only be a great advantage to the nation to lengthen the productive period of skilled labor and of men and women of energy, talent, and efficiency, but it would also be a means of increasing the span of human life and would be conducive to the solution of problems which today seem insolvable.

Finally, it is with sincere appreciation and with a feeling of humility that I accept the presidency of an association which has had numbered among its members such great and beneficent spirits as Stephen Smith, its founder; Walter Reed, discoverer of mosquito transmission of yellow fever; Gorgas, the great sanitarian; Welch, the scientist and inspiring leader; Sedgwick, the scholar and beloved teacher; McClintic, a martyr to science; Biggs, the public health statesman; and all of you who are laboring in season and out of season "that they might have life and that they might have it more abundantly."

As President of the American Public Health Association during the coming year, it will be my purpose to emulate the spirit and vision of those who have served so well the cause of public health.

Prostitution as a Source of Infection with the Venereal Diseases in the Armed Forces*

CHARLES R. REYNOLDS, M.D.

Major General, U. S. Army (Retired), State Department of Health, Harrisburg, Pa.

SINCE 1778, when General Washington directed the attention of the commanders of the armed forces to the gravity of venereal diseases, they have been the chief cause of disability and consequent loss of efficiency in the military establishment.

Even the violent explosions of epidemic diseases, such as smallpox, typhoid fever, intestinal and respiratory diseases, have affected the preëminent position of venereal disease as a cause of disability only in minor instances of short duration.

Venereal diseases cannot and do not originate in the Army. Of necessity they come from the civilian population. Prostitutes have been recognized as the chief source of infection and in expeditionary forces practically the sole infecting agent. The control of prostitution in time of peace is not a military function but rather a police responsibility of the civil authorities. Under war conditions the military authorities assume a larger responsibility, depending upon the nature and extent of civil government in the occupied territory. The well known changes in the practice in time of peace of this ancient commercial enterprise, which have been brought about by modern methods of living, influence methods of control considerably, but will have less to do with prostitution as a source of venereal infection in time of mobilization or actual war. Throughout military operations it is the prostitute who supplies the venereal infection; it is the prostitute who must be controlled to prevent venereal diseases in the military forces. These preventable diseases are the most constant and potent influence in sapping the effective strength of our military man power. They are intolerable in a military force built up after long and expensive processing involving recruiting, organizing, equipping, and training and often transporting to a distant theatre of operations.

These considerations occupy our minds today when this nation is facing mobilization. Better than ever before we have the means and the determination to control these diseases in our military forces.

The Army has records of venereal diseases dating back to 1819. No more reliable statistics are in existence. If

* Read at a Special Session on Control of Venereal Diseases in a National Defense Program, of the American Public Health Association at the Sixty-ninth Annual Meeting in Detroit, Mich., October 9, 1940.

venereal diseases are supposed to be relatively more prevalent in the Army than in the general population it is because the Army has discovered its venereal cases and recorded and published its records for 120 years. They antedate the registration of vital statistics in practically all of the states. During most of this time the general population had no more idea of the amount of venereal disease which it harbored than of the "damned nation total" of sin in general. In 1818, Dr. James Lovell was appointed Surgeon General of the Army. He reorganized the medical service on a truly national basis, instituted a system of reports and returns including vital statistics, and made his first report to the Secretary of War. With few interruptions, the statistics relating to venereal disease in the Army have been collected and recorded in the *Annual Reports of the Surgeon General,* a volume which has added much to medical literature. It will be seen how important venereal diseases have been in influencing the physical fitness of our armed forces for 120 years. Among these reports we find some very illuminating data. In 1819, the annual rate of admission for venereal disease was 118 per 1,000. During the Civil War, as during every war in our history, except the World War, the rate rose, and reached the highest all-time figure of 215 in 1867. During the Spanish American War it rose from 80 to about 140, and much higher during the Philippines Insurrection. Until 1909, only sporadic and desultory efforts were made to counteract this disease chiefly because of the ever present and deterrent influence of public opinion on our military policy. In 1909 a very significant measure was taken. The Surgeon General of the Army attempted to dispel the public attitude of indifference and prudishness regarding these serious diseases, to bring this subject out into the open, and to engage governmental and public participation in stamping out this evil. In his Report to the Secretary of War in 1910 the Surgeon General stated:

> The venereal peril has now come to outweigh in importance any other sanitary question which now confronts the Army, and neither our national optimism nor the Anglo-Saxon disposition to ignore a subject which is offensive to public prudery can longer excuse a frank and honest confrontation of the problem. There is no reason to think that these diseases are beyond the reach of preventive medicine any more than other contagious diseases, and their immunity from restriction must be attributed to the public disinclination to discuss them and legislate concerning them. It is now believed by most sociologists as well as sanitarians that the evil being primarily a social one can only be reached by a propaganda of public discussion and education, and that education in sexual matters and in the danger of venereal diseases should begin with the young and be carried on by means of all the agencies of popular enlightenment. A number of state and municipal health authorities as well as private associations are now publishing and distributing literature on this subject. It is believed that the War Department can not do better than adopt this general attitude and many of these methods, including a philosophical indifference to criticism on the part of self-constituted censors of the public morals whose susceptibilities are offended by a public discussion of these questions.
>
> *Report of the Surgeon General of the Army,* 1910, p. 59.

Here was the first attempt by the Federal Medical Services and probably the first serious step taken by any governmental authority to bring the venereal peril out into the open and to enlist public coöperation, through education and legislation, in a comprehensive campaign of eradication, a result which has been consummated largely by the U. S. Public Health Service and state departments of health with governmental backing.

The campaign in the Army started in 1909. As a result of the program of education, bi-monthly physical examinations, and chemical prophylaxis and disciplinary measures, the rate fell from

179 to 85 in 4 years. Shortly after our entrance in the World War it became evident that venereal disease was really one of our worst enemies and would soon bring about conditions well known throughout the history of armies. It was during this period that the measures of control were intensified and extended. The result was that venereal diseases were more decisively controlled than in any military event in our history. During this war the rate in the United States was 127.35, and in the A.E.F. 34.33. Even so, the venereal diseases ranked next to influenza as a cause of disability during the World War. There were 357,969 cases of venereal disease among the officers and enlisted men, representing 4,745,415 days lost in the United States, and 1,748,067 in the A.E.F.

Since the demobilization of 1919 the War Department has carried on a relentless war against venereal disease, and since 1926 the rate has been consistently less than 50, as compared with the rate of 175 for the period of 1904–1908 before active measures of control were instituted. Since 1935, the rate has been in the neighborhood of 34 to 36. Between 1909 and 1939, the rates of venereal diseases in the Army have been reduced more than those of any disease except typhoid fever.

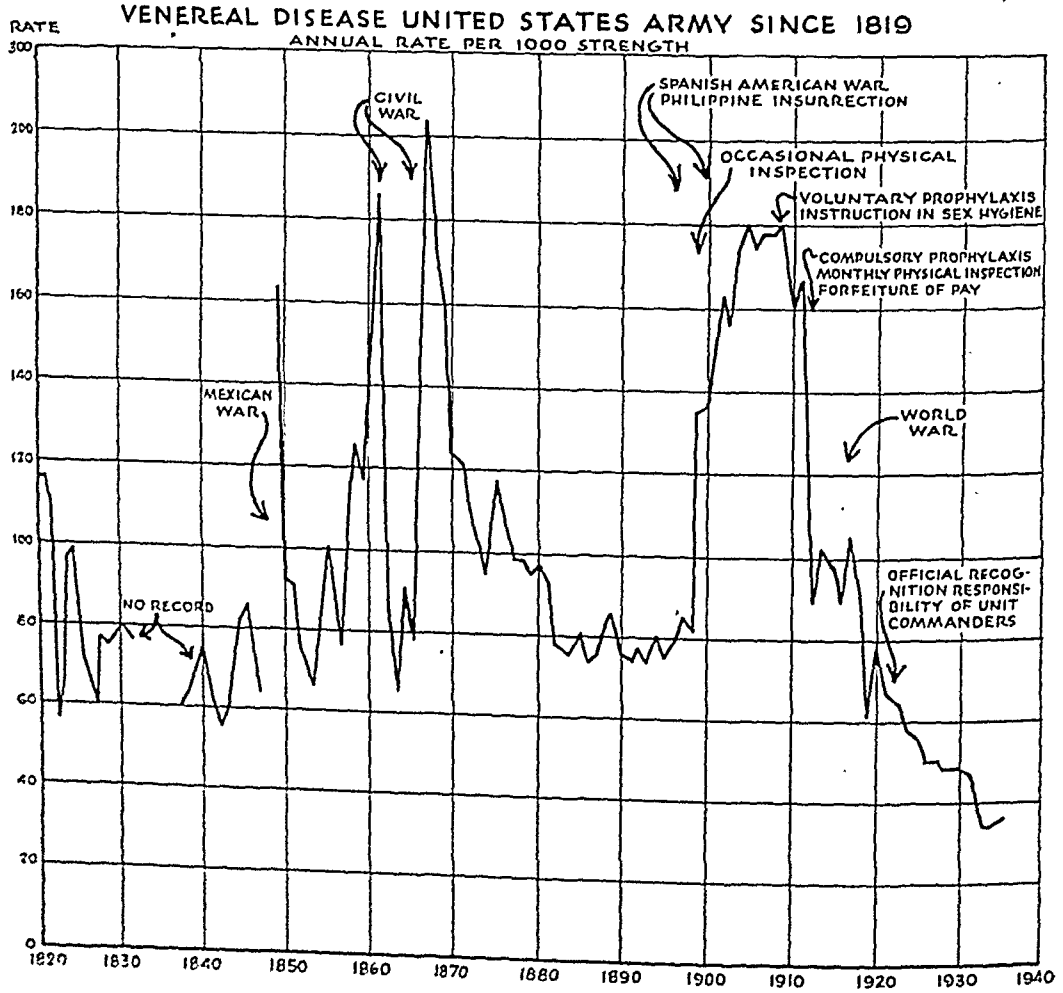


CHART 1—Venereal Disease in United States Army Since 1819

CONTROL MEASURES

Chronologically considered, the measures adopted and put in operation may be stated as follows:

1778 Forfeiture of pay (officer $10, enlisted men $4 per month) when admitted to hospital for venereal disease. This money was used to purchase shirts and bedding for the sick in hospital.

1814 Forfeiture of pay (non-commissioned officers, musicians and soldiers) for the same reason. This was 98 years before the present law of similar nature became applicable.

1863 Regulation of prostitutes by the Commander General of the Union Forces near Nashville.

1864 Same by Commander General of the Union Forces near Memphis.

1899 Education in sex hygiene and venereal diseases, and physical examination of the troops in Cuba, Philippine Islands and the United States.

1902 Recognition of the responsibility of the company commander for the control of venereal disease. (*War Department Circular 10,* 1902.)

Up to 1909 control measures were those introduced and carried out largely by the Surgeon General and medical officers of the Army.

1909 Introduction of educational and recreational programs, physical examinations and the use of chemical prophylaxis. (K Packet.)

1911 End of experimental era.

1912 Establishment of a comprehensive program of:

1. Instruction in sex hygiene and venereal diseases
2. Compulsory chemical prophylaxis with penalty for avoidance or neglect
3. Physical examination twice a month
4. Confinement or segregation of patients and those infected

Act of Congress 1912 required forfeiture of pay of officers and enlisted men while off duty on account of certain diseases, including venereal. (*W.D. Gen. Order 31,* 1912.) The 107th Article of War required time lost because of such disease to be made good before completion of term of enlistment.

1917 to 1919 Intenstification of administrative efforts of control including assistance of American Social Hygiene Association, Inter-Departmental Social Hygiene Board, and extra-military sanitation activities by the United States Public Health Service authorized by Law of 1917 and Executive Order which also restricted sale of alcoholic liquors and prohibited houses of prostitution near military posts and camps. State and local health authorities coöperated. In A.E.F., G.O. 77, December, 1918, and subsequent sanitary orders requiring:

1. Education in sex hygiene and venereal diseases
2. Prophylaxis
3. Physical examinations
4. Repression of prostitution
5. Reporting sources of infection and dispensary treatment of infected civilian population
6. Enforcement of laws relating to alcoholic liquors
7. Court-martial
8. Treatment of venereals with their organizations near the front

Prominent among these measures was the recognition of company officers' responsibility for controlling venereal disease, which was considered a function of command and is so prescribed today by Army Regulations.

Under General Pershing's vigorous assault on venereal diseases the rates in the A.E.F. came down to about 34, notwithstanding that the campaign was conducted amid an environment offering in many instances extraordinary opportunities for exposure. General Pershing's determination to return the boys to the United States as clean as when they left their home shores was more than accomplished.

1940

In general the measures found effective since 1909 but especially so during the World War are still in use in the Army and Navy. As many weapons have been used simultaneously, it is difficult to establish their relative effectiveness. Certainly their value is influenced by the force behind them and the prevailing local conditions. I believe that the assumption by the immediate military commanders of their responsibility for controlling venereal diseases and the use of chemical prophylaxis have been most effective. Prophylaxis, if used immediately and intelligently, is nearly 100 per cent effective. Our records emphasize the importance of early prophylaxis. At Bordeaux where

our prophylaxis stations were fairly accessible, the rate of infection after 100,000 exposures regardless of time was 1.7 per cent. Used within 1 hour it was 0.08 per cent non-effective; within 4 hours 1.05 per cent, and after 10 hours it was 7.4 per cent.

The advisability of punitive measures for failure to take prophylaxis has been questioned particularly in recent years because of the inaccessibility of prophylaxis facilities brought about by the extended travel of men on pass especially over the week-ends. This will not be a factor to such an extent during war.

Until recently soldiers with venereal disease and who failed to take prophylaxis were court-martialed. Recent changes in Army Regulations provide for court-martial only for concealing venereal disease.

PROSTITUTION

The history of this common vice is well known, likewise its influence on armies. Dislocated from home influences and transplanted in a foreign environment, troops in the field become the prey of prostitutes who spring into evidence as soon as military concentration begins, and follow troops through the various campaigns.

As examples of the extent and gravity of prostitution as a source of venereal disease, we will select two of our more recent experiences, the conditions in France during the World War, and those seen during the maneuver concentrations in the southern states in the early months of 1940.

In France prostitution was considered a necessary evil and recognized as a legitimate enterprise in many places, protected by police and taxed as other industries for the support of the government. The vice situation was well described by Abram Flexner before the World War. His studies showed the immensity of this enterprise in Europe and the failure of the government to cope with the situation due to secrecy and reluctance of the public to recognize and control the evil. The French system of regulating prostitution had been an utter failure. The physical examinations were a farce. Our official observers in France, after investigations made during the first 4 months of the American occupation, reported that these examinations were conducted at the rate of more than one per minute, no bacteriological examinations were made, and no system of sterilization of instruments was in effect. A bill of health handed to the French prostitute was perfectly worthless and therefore dangerous. Actual surveys made in consequence of the San Nazaire " explosion " in December, 1917, which sent the rate among American troops from 54 to 201, showed that these cases could be traced definitely, 15 to one house of prostitution, 10 to another, 20 to another and 54 to another. The order of General Pershing placing these houses out of bounds reduced infection immediately. From then on, such measures steadily reduced the rate, when in October, 1918, it became as low as 16 per 1,000.

In Paris, conditions were worse than in most other military centers. The houses of prostitution harbored relatively few women, probably not over 20 per cent of the trade, but there were 5,000 with private rooms and 25,000 clandestine prostitutes in Paris during the period of military operations. Physical examinations of those registered meant practically nothing, for the civil authorities reported that during 6 years only 5 cases of syphilis were found in 43 of these houses in Paris. Police reports in 1918 showed only 14 per cent infected with venereal disease, but reports of medical officers of the Army showed 80 per cent of these women infected. The Commander General of the 8th French Army reported syphilis as 8 times more prevalent than at the beginning of the war in 1914. Reports

received at American Headquarters showed that in the French army up to 1917 there had been treated 800,000 cases of gonorrhea and 200,000 cases of syphilis. It is to believed that most of these cases came from prostitutes or other women differing from them only in nomenclature.

A recent sign of what may become our responsibility in a national mobilization comes to us from a survey in and about two southern cities during the military maneuvers near those places in December, 1939, and the early part of 1940. These surveys were conducted by agents of the American Social Hygiene Association and by the U. S. Public Health Service, engaged in extra-military sanitation. Prostitution and its accompanying vices seemed to be the chief enterprises in one of these cities which bore the reputation of being the most notorious center of this kind in the South. Opportunities for exposure were extraordinary. Among 85 prostitutes examined by health officers, one-third were found to have syphilis and one-half gonorrhea, and many had both. The effect upon the sick rate was immediate.

The situation in the adjoining military station was brought under control only after most vigorous measures were instituted by the military commander with the assistance of the U. S. Public Health Service upon request of the Surgeon General of the Army and with the further assistance of the American Social Hygiene Association in coöperation with state and local health and police authorities.

This little event of last spring again emphasizes the inevitable tendency of prostitutes to assemble around military concentrations and to follow the troops with patriotic devotion. It is but a reminder of the swarms which flocked to the leave areas of the Riviera following the Armistice and took up the trek to the embarkation ports, particularly Bordeaux, San Nazaire, and Brest as the two million men of the A.E.F. started for home. It can happen again.

PLAN OF CONTROL

Prostitution must be recognized as a Fifth Column in our midst to be dealt with accordingly.

Without restraint the forces of prostitution can decimate a military command. These forces strike the moment mobilization and concentration of military personnel begin, and hang upon the flanks of the forces as they move from one theatre of operations to another.

It would seem that modern life has changed the tactics of prostitution to keep it current with changes in the methods of war. As Colonel Dunham puts it, " Prostitution has been motorized while the army has become mechanized." The operations of a mechanized army cover a wide territory calling for a more universal coöperation by local health and police authorities with military commanders.

A " limited emergency " has been declared; the Army and Navy are being enlarged; mobilization of the National Guard and the Reserves has started, and the draft for universal military service will soon be made.

The plan of control today should be one attuned to the requirements of the present military situation and in principle should include:

1. Military measures—continuation of the peace program of prevention, intensified to meet the dangers inherent in a rapidly enlarged Army and Navy
2. Assistance of state and municipal health and police authorities acting under existing statutes and ordinances which in most localities authorize arrest, quarantine and treatment of prostitutes known to have venereal disease
3. Assistance of the U. S. Public Health Service in extra-military sanitation as already authorized by law and now provided by the Administrator of the Federal Security Agency
4. Assistance by an awakened public and such agencies as the American Social Hygiene Association and similar organizations.

A joint agreement setting forth the plan of "Coöperation of the U. S. Public Health Service in Extra-Military Sanitation" has been prepared and published (September, 1940) and reads as follows:

During the past several months the U. S. Public Health Service, using its own resources in association with state health services, has rendered valuable coöperation to the Army in safeguarding the health of military personnel by suitable measures of extra-military sanitation in the vicinity of maneuver areas and of Regular Army stations.

The control of venereal diseases continues to be one of the more important health problems, both to the military and civilian authorities. Representatives of the U. S. Public Health Service, of the Surgeon General of the Army, and the Surgeon General of the Navy, have prepared a joint agreement which it is believed will assist in the reduction of the spread of venereal diseases. This agreement has been approved by the Administrator of the Federal Security Agency, the Secretary of War, and by the Secretary of the Navy.

The Secretary of War directs that this agreement be brought to the attention of and adhered to by all officers in the Army. The agreement is as follows:

"It is recognized that the following services should be developed by state and local health and police authorities in coöperation with the Medical Corps of the United States Army, the Bureau of Medicine and Surgery of the United States Navy, the United States Public Health Service and interested voluntary organizations:

"1. Early diagnosis and adequate treatment by the Army and the Navy of enlisted personnel infected with the venereal diseases.

"2. Early diagnosis and treatment of the civilian population by the local health department.

"3. When authentic information can be obtained as to the probable source of extra-marital venereal disease infection of military or naval personnel, the facts will be reported by medical officers of the Army or Navy to the state or local health authorities as may be required. If additional authentic information is available as to extra-marital contacts with diseased military or naval personnel during the communicable stage, this should also be reported.

"4. All contacts of enlisted men with infected civilians to be reported to the medical officers in charge of the Army and Navy by the local or state health authorities.

"5. Recalcitrant infected persons with communicable syphilis or gonorrhea to be forcibly isolated during the period of communicability; in civilian populations, it is the duty of the local health authorities to obtain the assistance of the local police authorities in enforcing such isolation.

"6. Decrease as far as possible the opportunities for contacts with infected persons. The local police department is responsible for the repression of commercialized and clandestine prostitution. The local health departments, the State Health Department, and Public Health Service, the Army and the Navy will coöperate with the local police authorities in repressing prostitution.

"7. An aggressive program of education both among enlisted personnel and the civilian population regarding the dangers of the venereal diseases, the methods for preventing these infections, and the steps which should be taken if a person suspects that he is infected.

"8. The local police and health authorities, the State Department of Health, the Public Health Service, the Army and the Navy desire the assistance of representatives of the American Social Hygiene Association or affiliated social hygiene societies or other voluntary welfare organizations or groups in developing and stimulating public support for the above measures."

CONCLUSIONS

Venereal diseases need not exact a toll from the military forces comparable with past experiences for several fundamental reasons, namely:

They are preventable.

Their prevention is largely an administrative proposition consisting in measures now formulated and standardized through experience in the Army and Navy, and successfully tested during the World War and in the campaign carried on in the civilian population by the federal, state, and local health services. Coöperation by the U. S. Public Health Service, state and local health and police authorities, with the military authorities has been more fully developed. And last, but of great importance, an awakened public attitude toward this menace which provides an ally to the military forces which never before has been adequately mobilized.

Relationship of the Health of Civilians to Efficiency of the Army*

JAMES C. MAGEE, M.D., Sc.D.

Major General, The Surgeon General, U. S. Army, Washington, D. C.

GOOD health is just as essential to the success of a nation as it is to an individual; and it can be stated as an axiom that the efficiency of the armed forces of a country depends primarily upon the health and physical stamina of its civil population. Nowhere has the truth of this statement been more clearly demonstrated than in the United States, which has always maintained only a small peace-time army and has met each of its major military emergencies by the rapid mobilization of an army of civilian soldiers. It is obvious that our war-time armies are made up largely of uniformed civilians and supported by ununiformed civilians for the protection of all the civilians of the nation. Under such conditions the level of health in the general population must of necessity determine the degree of efficiency to be attained by the armed forces.

In view of the present concern over national preparedness it may be of interest to indicate briefly a few of the problems which will arise from this interrelationship between civilian health and effective military activity in the event of a future mobilization or war. These problems will be considered under the following headings: (1) The procurement of physically fit military personnel, (2) The maintenance of a healthy Army, and (3) The present health status of the civil population.

THE PROCUREMENT OF MILITARY PERSONNEL

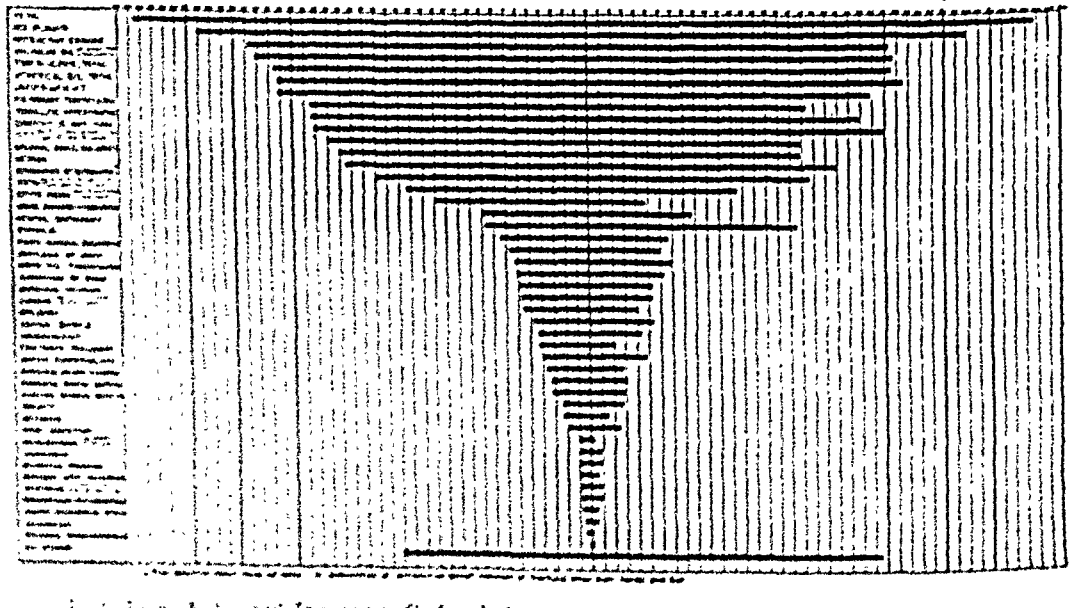
The procurement of an adequate number of physically fit men for service in the Army will naturally depend upon the number of such individuals available in the civil population; and the degree of physical perfection that can be required in their selection will depend on the level of health which prevails throughout the nation. As recruits are drawn from all sections of the country and from every social group, the average American soldier represents a cross-section of American manhood, endowed with the mentality, philosophy, habits, and physique afforded by his civil environment. The degree of cultural development in the regions from which recruits are received is reflected in the education, ability, character, and physical stamina of its young men. The higher the cultural level of the community, the more apt are its inhabitants to be well informed concerning proper diet, personal hygiene, and the elements of public health, and the more likely are they to have been immunized against certain preventable diseases.

* Read at a Special Session on The Control of Venereal Diseases in a National Defense Program of the American Public Health Association at the Sixty-ninth Annual Meeting in Detroit, Mich., October 9, 1940.

Physical Standards—In the selection of military personnel it is necessary to establish physical standards high enough to insure obtaining an adequate number of men who will be able to perform all the arduous duties required of them. Yet these standards must not be so high as to exclude from service individuals who have temporary, reparable or non-incapacitating defects. At the same time it is necessary to guard against the selection of men with minor defects that may later become disabling or be used as a claim against the government. For example, such conditions as tuberculosis or certain nervous and mental diseases are causes for rejection, while other defects such as enlarged tonsils or carious teeth are not.

Defects Found in Drafted Men—The results obtained by physical examination of the large numbers of individuals selected for service during the World War affords an excellent index of the health of the country at that time. Between April 1, 1917, and December 31, 1919, a total of about 4 million men were drafted for duty in the United States Army. Over half of these individuals were found to be free from any significant physical or mental blemish, but 468 out of each 1,000 men examined were found to have one or more physical defects. About 90 per cent of these defects were not of such a nature as to interfere seriously with the individual's ability to perform services of the highest order in civil life. Moreover, they were not of equal importance from the viewpoint of military service, and this led to the classification of all men in the following groups: (A) men accepted for general military service including (1) those with no defects, and (2) those with minor non-incapacitating defects; (B) men with defects curable by operation or otherwise; (C) men with defects permitting them to perform only noncombatant military duties; and (D) men who were rejected as physically disqualified for any kind of military service. This great health survey showed that 46.8 per cent of the drafted men had important mili-

CHART 1.—DEFECTS OR DISEASES, SELECTED URBAN AND RURAL (ALL OTHER) COMMUNITIES



[illegible] Defects Found in Drafted Men. Gov't Print. Off., 1919)

tary defects, that 21.2 per cent were rejected as unfit for any kind of military service, and that 8 per cent were available only for limited noncombatant service. Thus about one-third of this enormous sample of the young men of the country were found to be unfit for duty with the fighting units of the Army.

The relative proportion of the different types of defects were approximately as follows: (1) mechanical defects of bones, joints, and appendages 39 per cent, (2) defects of sense organs 12 per cent, (3) cardiovascular diseases 10 per cent, (4) defects of development and metabolism 10 per cent, (5) nervous and mental defects 6 per cent, (6) venereal diseases 5.8 per cent, (7) tuberculosis 5.4 per cent, (8) diseases of the nose and throat 5 per cent, (9) those of the skin and teeth 3 per cent, (10) those of the respiratory organs (other than tuberculosis) 1 per cent, and (11) others about 3 per cent. The rate for each of these defects per 1,000 men examined are indicated in Chart 1, which is from Love and Davenport.[1]

About half the individuals in the mechanically defective group, or more than 300,000 men, had weak feet; one-fourth had deformed or injured appendages, and almost one-fifth had hernia. In the group with sense organ defects, one-half had visual errors, and one-fourth had diseases of the ears including deafness. The most important of the developmental and metabolic defects noted were as follows: substandard weight and height, deficient chest measurement. curvature of the spine, defective development of the genitalia, cleft palate and hare lip. Mental deficiency was noted in more than 40,000 men and other mentally deficient individuals were identified on subsequent examination. Hypertrophy of the tonsils was noted in 64,000 men; and defective teeth in about 40,000. The most important infectious diseases identified were tuberculosis, which was found in 30 of each 1,000 men examined, and the venereal diseases for which the rate was 32 per 1,000.

The further analysis of these results of the World War Draft Examinations afforded valuable information concerning the nature of these defects and diseases, and indicated their geographical, racial, and social distribution in the civil population. The observations were summarized in 1920 by Davenport and Love [2] as follows:

> The northeastern part of the country appears to be characterized by congenital defects and those of city life. The northwest is characterized by deformities due to accidents, by goiter, and by flat foot. The southeast is characterized by venereal diseases, hookworm and similar complications, including blindness of one eye, arthritis and ankylosis, underweight, mental defect, emotional disturbances, by pellagra, hernia, loss of upper extremity, and bullet and other wounds. The southwest is characterized by tuberculosis, drug addiction, hypertrophied tonsils and hernia. The northern central area is contrasted with the southern central by having more goiter, less tuberculosis, much less venereal disease, more varicocele and more varicose veins, more valvular disease of the heart and cardiac hypertrophy and dilatation, more deficient teeth, more psychoasthenia and constitutional psychopathic states. It is characterized by more otitis media, errors of refraction, diabetes, curvature of the spine, defects of genitalia and weak feet, but less epilepsy, blindness of one eye, pellagra, loss of upper extremity, bullet and other recent wounds, underweight and deficient chest measurement. From a military standpoint the northwest contains the best men of the country.

MAINTENANCE OF A HEALTHY ARMY

When the recruit has entered the service, the subsequent protection of his health becomes a responsibility of the Medical Department of the Army. However, the satisfactory fulfillment of this obligation may depend on a variety of factors over which the Medical Department has no control. Thus the task is easier during peace time than in periods of mobilization or war; and under either condition there is always the possibility that troops may contract disabling dis-

CHART 2—ADMISSIONS TO SICK REPORT, U. S. ARMY
PRINCIPAL CAUSES 1938—ANNUAL RATES PER 1,000
(From *Annual Report of The Surgeon General, U. S. Army, 1939*)

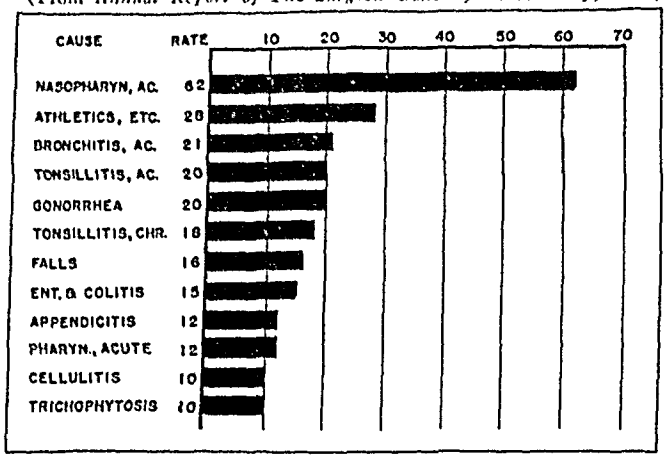


CHART 3—DEATHS IN U. S. ARMY
PRINCIPAL CAUSES 1938—ANNUAL RATES PER 1,000
(From *Annual Report of The Surgeon General, U. S. Army, 1939*)

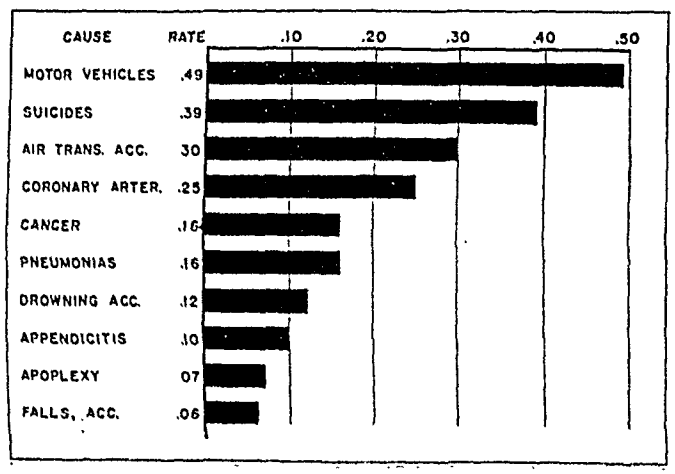


CHART 4—DISCHARGES FOR DISABILITY IN THE U. S. ARMY
PRINCIPAL CAUSES 1938—ANNUAL RATES PER 1,000
(From *Annual Report of The Surgeon General, U. S. Army, 1939*)

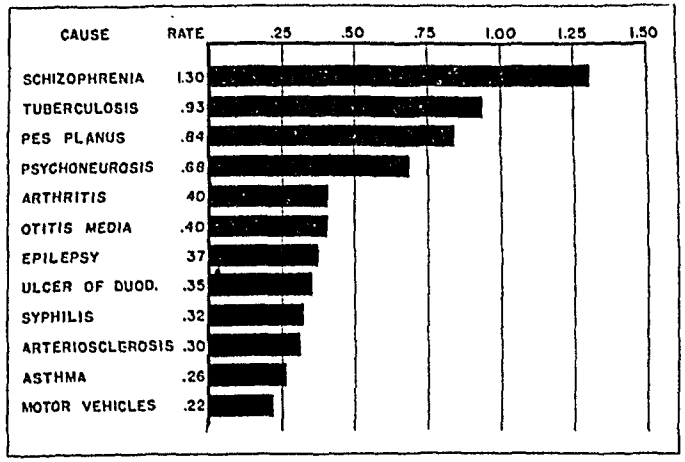
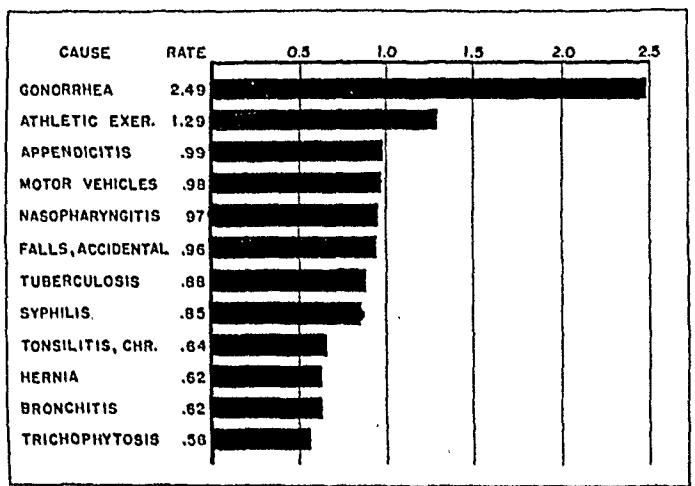


CHART 5—NON-EFFECTIVENESS IN THE U. S. ARMY
PRINCIPAL CAUSES 1938—ANNUAL RATES PER 1,000
(From *Annual Report of The Surgeon General, U. S. Army, 1939*)



eases through contact with the civil population.

During Peace—Our peace-time Army has an enviable health record. The soldier is housed in a modern, well ventilated barrack located on a carefully sanitated military reservation. He is given a scientifically balanced diet of wholesome food, furnished adequate clothing, and required to engage in supervised physical exercise. He is trained in personal hygiene, and the state of his health is under the constant supervision of well qualified medical officers. In case of illness or accident he receives immediate medical attention and if necessary he is treated in an Army hospital. During 1938 when the strength of the United States Army was 182,000, the annual morbidity and mortality rates per 1,000 troops were the lowest ever recorded for our forces.[3] The rate for admission to sick report was 542 and the death rate was 3.2. The daily noneffective rate was 27.6 and the rate for discharge from service because of disability was 12 per 1,000. The principal cause of these admissions, deaths, days lost, and discharges are shown in Charts 2, 3, 4 and 5.

During Mobilization—During mobilization it may be necessary to expand the peace-time facilities for the care of troops within a relatively short time. However, the necessity for speed, and the emergency nature of the mobilization may result temporarily in less satisfactory arrangements for limiting the spread of infectious diseases. The rapidly assembled, unseasoned recruits are endowed with different degrees of immunity and susceptibility to infections depending on conditions in their civil environments. They bring with them from these environments, and introduce into newly gathered groups, a miscellaneous assortment of pathogenic organisms, especially those which are carried into the respiratory secretions. Therefore, one of the great problems of mobilization is the prevention of the epidemic diseases caused by such organisms. Since many of these epidemics come from the civil population, their control must depend on the combined efforts of both the military and civil health agencies.

During War—When the soldier has completed his period of training and enters the theatre of operation, he is faced with the new hazard of injury or death due to battle. However, he is still exposed to a variety of infectious diseases, most of which originate among civilians either in his own country or that of the enemy. In each of our wars since the American Revolution, the infectious diseases have been responsible for a larger proportion of casualties and deaths than have battle injuries. However, since the development of modern preventive medicine and the resulting improvement in civilian health, there has been a significant decrease in the proportion of disease casualties among troops. The nature and severity of these diseases have differed in each of our conflicts, but prior to the World War the intestinal and respiratory infections were of primary importance. During that war, thanks to the development of military sanitation and to triple-typhoid vaccination, the incidence of the enteric diseases was markedly reduced, and typhoid and the paratyphoid fevers were of little significance. However, the respiratory diseases, particularly influenza, struck in epidemic force and again the disease casualties and deaths were more important than those attributable to battle. There were 50,000 deaths due to battle and 58,000 caused by disease. Thus our World War experience reëmphasized the fact that the ability to raise and maintain a healthy Army depends on the status of medical development and health in the civil population.

As the United States is now planning to develop a strong Army for national defense, it is of interest to consider the

present status of the nation's health and of the medical facilities which will be available to insure a healthy and efficient military establishment.

PRESENT STATUS OF THE NATION'S HEALTH

Improvements in Civilian Health Since the World War—The period since the World War has been characterized by a renewed interest in the improvement of living conditions in the United States; and by extraordinary progress in public health. This progress has resulted from a well organized campaign in which many health and welfare agencies have coöperated. Federal, state, and local health departments have been expanded and revitalized. There has been an increase in the facilities for training public health personnel, and this has stimulated a wider appreciation of preventive medicine. The governmental health departments have been supplemented by other official welfare agencies, and by a number of nonofficial health groups including certain heavily endowed philanthropic organizations.

The main effort has been directed against the following groups of preventable diseases: (1) infectious diseases, (2) diseases caused by inadequate or deficient diet, (3) diseases resulting from unhygienic or unsanitary living and working conditions, (4) diseases associated with the puerperal state, and (5) diseases transmitted from parents to their offspring.

Vigorous measures have been employed for the control of the communicable diseases, with special emphasis on such condi-

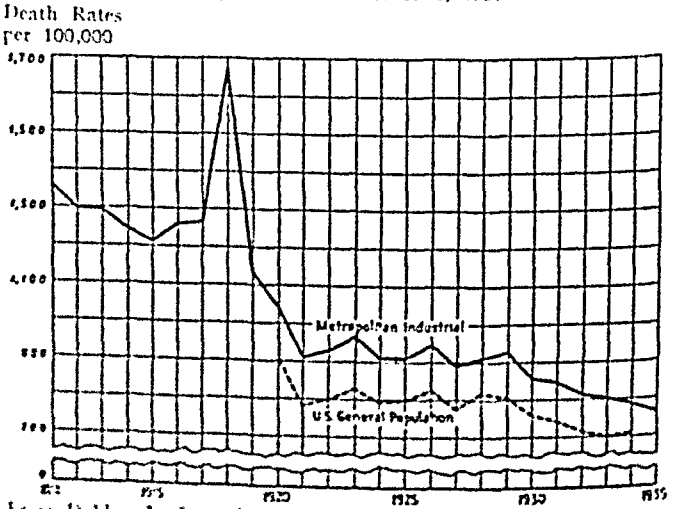
of childhood, the venereal diseases, tuberculosis, pneumonia, and malaria. The measures used have included facilities for case finding and home visits to patients, immunization, and the offering of free diagnostic and therapeutic services to the indigent. A serious attempt has been made to educate the public concerning the fundamentals of nutrition and so to raise the standard of living that an adequate well balanced diet will be available to the average citizen. Experts in public health engineering have been employed for the promotion of environmental sanitation, including the protection of water supplies, the safeguarding of waste disposal, the sanitary control of milk and food production, the sanitation of food handling establishments and insect control. Special attention has been paid to the improvement of living conditions, housing, and to industrial hygiene. The great waste in human life incident to the puerperal state, infancy, and childhood, has been reduced in many states by providing maternity, infant, and pre-

CHART 6—ALL CAUSES OF DEATH

STANDARDIZED ANNUAL DEATH RATES PER 100,000 TOTAL PERSONS

AGES 1 TO 74 YEARS

Metropolitan Life Insurance Company, Industrial Dept., 1911 to 1935, and U. S. Registration States of 1920, 1920 to 1934



From Dublin, L. I., and Lotka, A. J. *Twenty-five Years of Health Progress*; Metropolitan Life Insurance Company, New York, 1937, page 26.

school health services in homes and clinics; and services in schools for the detection of physical defects and for instruction in hygiene and public health.

Because of the limited time available I shall not attempt to discuss in detail the remarkable progress made in this comprehensive program for the improvement of the nation's health. There is no doubt, however, of its effectiveness, which is clearly indicated by the appreciable increase in the average span of life in this country during the last quarter of a century. The trend of the annual total death rates for the United States from 1911 to 1935 is shown in Chart 6, published by Dublin and Lotka.

The Health of Our Expanding Army —Because of the alarming international situation, the United States has wisely decided to increase its defenses immediately by the development of an adequate Army. The necessity for rapidly expanding all our peace-time facilities in order to care for larger number of recruits, will create conditions somewhat similar to those encountered during the early period of mobilization for the World War. However, in many ways we are better prepared to meet the present situation.

In the first place, it appears that because of the marked improvement of the health of the civil population, one might expect a larger proportion of those examined to be physically qualified for military service. However, the results will be somewhat modified by changes in the examination procedure. For example, the physical standards to be used in the selective service examinations have been carefully revised. Moreover, it is proposed to render this examination more exact by the routine use of such diagnostic procedures as x-ray of the chest for tuberculosis, and serological tests for syphilis. Such procedures should result in the selection of a more effective initial force.

In the second place, the progress made in preventive medicine since the beginning of the World War should make it possible to safeguard more effectively the health of our new Army. Definite policies already have been adopted for the sanitation of cantonments and for the construction of barracks and hospitals which will provide adequate bed space, and ventilation. the plans for clothing and feeding the troops are based on careful investigations and the best scientific advice available. In the attack on communicable diseases great stress is being placed on the avoidance of overcrowding and on instruction on personal hygiene, with special emphasis on the prevention of venereal diseases. The coöperation of the Public Health Service has been obtained, and that organization has assumed responsibility for sanitation and the control of disease in civilian areas adjacent to military reservations or troop concentrations.

At this time it is impossible to predict what specific diseases may arise to interfere with the efficiency of our Army should we be forced to engage in another war. This will depend on many complex factors, including season, climate, geographic location, and local health conditions among neighboring civil populations, Yet in view of the present program for hemisphere defense, it appears that a great variety of disease conditions, including the so-called tropical diseases. must be considered as potential hazards, and that plans must be made to combat them. Fortunately, we are now better prepared to control certain of these diseases, but for others we still need more effective methods.

Thus the new chemotherapeutic agents, including sulfanilamide, sulfapyridine, and sulfathiazol, should be of great value for the prevention and treatment of the pyogenic infections of wounds, and the treatment of many acute diseases including the pneumonias,

meningitis, and gonorrhea. All troops will be actively immunized with smallpox and triple-typhoid vaccines, and with tetanus toxoid. If required, they may also be immunized against diphtheria, scarlet fever, cholera, or yellow fever. Field investigations are now being conducted to determine the value of experimental vaccines against pneumococcus pneumonia, influenza, and typhus, and it is hoped that these agents may later be added to our armamentarium.

On the other hand, there are many diseases against which we have no adequate protection, and many problems which still require intensive investigation. For example, more effective methods are needed for the prevention of: gas gangrene, the venereal diseases, many of the respiratory tract infections, the diarrheal diseases, and certain of the important insect-borne diseases, particularly malaria, typhus fever, plague, and epidemic encephalitis. Last spring in anticipation of the present military expansion, arrangements were made through the National Research Council for the organization of a number of civilian advisory committees to assist the Medical Department in the solution of these and many other important problems. These committees which are composed of distinguished leaders in all branches of medicine have already rendered service of the greatest value.

In closing, I wish to remind you that the Army is a vital part of the nation, being bone of its bone and flesh of its flesh, and that its unsolved medical problems constitute a serious challenge not only to its Medical Department, but to the entire medical profession of this country. I feel sure that, as in the past, the doctors of America will accept this challenge—and will work wholeheartedly for the protection of the Army's health.

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Relationship of the Health of Civilians to Efficiency of the Navy

With Special Reference to the Venereal Disease Problem*

COMMANDER CHARLES S. STEPHENSON (MC) U. S. NAVY

In Charge, Division of Preventive Medicine, Bureau of Medicine and Surgery, Navy Department, Washington, D. C.

IN the daylight—or long twilight—that will follow the fire of war and smoldering hate in Europe, Asia, and Africa, and the record of our defense program, those who write histories of this period will see a story of defense lines—lines that were broken, lines that were abandoned, lines that held. Those of us who have traveled in Europe or Asia in recent years were haunted by the sense that the world was rapidly reverting to a barbaric age. In whatever country one traveled, it seemed that the energy and man power of nations were employed in erecting strange piles of steel and stone to withstand stranger engines, or mole-like burrowing under ground to construct monolithic labyrinths for hidden armies. Belgium and Holland built dykes that could be flooded by raising a single lever. Rumania repeatedly dug huge ditches to flood with oil which could be ignited when the enemy came too close. Everywhere people put blind faith in these engineering achievements.

Ungrudgingly huge sums were sacrificed in the belief that these fortifications were impregnable. No one dreamed the Maginot Line would fail. Yet it failed. We shall never know how some of these lines would have held under attack, because many were not attacked.

War's explosions on two continents have forced us in America to undertake in the most expeditious manner possible a huge program of defense.

One line that we must and shall build is a line of defense against disease, which has always maimed and killed more people than bullets in any war. Now that political science has so miserably failed in this world crisis, it is incumbent upon the medical sciences to build lines that shall not fail to hold disease.

In order that our military forces may be able to carry out their mission, it is necessary that we "keep as many men at as many guns as many days as possible." Today we need to expand that mission and keep as many men at as many tools as many days as possible. To accomplish this dual task it is obvious that the health of the civilian population is vital to the efficiency of the Army and Navy. Many problems will arise that will tax the skill and resources of the several state health

* Read at a special session on The Control of Venereal Diseases in a National Defense Program of the American Public Health Association at the Sixty-ninth Annual Meeting in Detroit, Mich., October 10, 1940.

departments. The greatest single health problem is syphilis, and it is one whose control will not only greatly assist the military surgeon to conserve man power and effectiveness of the armed forces, but will be of lasting benefit to the civil population.

I look upon the subject of syphilis as the great question of the day. It was formerly a question of treatment . . . but that day has passed. It is now a question of prevention, of eradication, of the protection of the well against the contamination of the sick. In other words, it is no longer a question for the therapeutist but one for the sanitarian, the philanthropist, the legislator, the statesman. It is one of public health and as such we are bound to meet it. The time has come when we can no longer shut our eyes to its evil and we must deal with it precisely as we deal with other evils that affect the health of the people. . . . It is our duty to enlighten the public upon all questions of public health. . . .

Now what I propose in regard to syphilis is simply to give to the existing boards of health . . . the same power over syphilis that they now possess over cholera, smallpox and yellow fever. They now have the power of ferreting out these diseases and they should have the same power of searching out the abode of syphilis and of sending its victims to hospitals for treatment. For stamping out the disease in towns and cities their boards of health must have plenary powers of absolute character over syphilis; not more so, however, than they now possess over smallpox.

Thus I say that I would simply include syphilis in the great family of contagious or communicable diseases and make it subject to the same laws and regulations that we already possess for their management. . . .

Shall it be said that we, the representatives of the medical profession of a great nation, . . . will longer let the people remain in ignorance of the dangers that surround them? No, my friends, we must boldly proclaim the truth and scatter it broadcast over the length and breadth of the land. We must call to our aid the press, the pulpit, yea, the women of the country . . . we must . . . call upon our state and county medical societies to do our bidding and to coöperate with us. We must keep the subject not only before the profession but we must keep it before the people. . . .

Doubtless there are those among you who will regard this statement as too radical for a Naval Medical Officer to advocate. While endorsing every word of this statement, it is proper to report that it is quoted from the presidential address of J. Marion Simms[1] before the American Medical Association in 1876—64 years ago.

The first evidence that this statesmanlike viewpoint was ever seriously considered was at the outbreak of the World War in 1917. The present need is well illustrated by the World War attitude, and Secretary of War Newton D. Baker's letter to the governors of the states and the chairmen of the State Councils for National Defense:

I am very anxious to bring to the attention of the State Councils of Defense a matter in which they can be of great service to the War Department. In the training camps already established, large bodies of men, selected primarily from the youth of the country, will be gathered together for a period of intensive discipline and training. The greater proportion of this force will probably be made up of young men who have not yet become accustomed to contact with either the saloon or the prostitute, and who will be at that plastic and generous period of life when their service to their country should be surrounded by safeguards against temptations to which they are not accustomed.

Our responsibility in this matter is not open to question. We cannot allow these young men, most of whom will have been drafted to service, to be surrounded by a vicious and demoralizing environment, nor can we leave anything undone which will protect them from unhealthy influences and crude forms of temptation. Not only have we an inescapable responsibility in this matter to the families and communities from which these young men are selected, but, from the standpoint of our duty and our determination to create an efficient army, we are bound, as a military necessity, to do everything in our power to promote the health and conserve the vitality of the men in the training camps. I am determined that our new training camps, as well as the surrounding zones within an effective radius, shall not be places of temptation and peril.

With the demobilization of the military and naval forces there was a concurrent demobilization of highly trained social hygienists and drastic reduction

of funds from the federal government for the control of venereal disease. Men were discharged from the military services who were believed to be non-contagious. It was believed then; and it is now known, that many of the men suffering from syphilis were not adequately treated. Their return to civil life soon resulted in the occurrence of syphilis in communities where, before the war, it was seldom seen. Such a condition must not be allowed to recur.

Wars are no longer declared—they just happen. And none of us will rest easy over the Battle of Britain until this war is won, or until we have completed our defense program.

Today—as in 1917—the nation is faced with the necessity of quickly re-establishing large munition works and bringing to these industrial establishments the millions of skilled men and women needed to produce the munitions of war. The increased complexity of our national affairs, our changed industrial development, and the vast range of social dislocations stemming from this effort will present old problems in new guises. With each man called into industry or to the training areas, on the average, at least one of his relatives will follow him. What will be the condition of the new environments for these dependents? Will housing be adequate? Will food and clothing be within the reach of their several budgets? Some of these people who have followed their kin to new locations will become ill. Will adequate medical care and reasonable hospital facility be available? If these problems are not met, the soldier, sailor, or his industrial "buddy" will worry and his effectiveness will be greatly reduced.

The long depression and unemployment have created a multitude of new facets to old problems. Skilled men have long been away from certain machines, and when the preparedness program reaches its full stride, it will be necessary for these older men to be recalled. They will find that they have lost skill and manual dexterity and will resent reëducation. Also some of these men will have acquired syphilis since they were last employed in skilled industry. Provision must be made to protect the non-infected from the infectious and some machinery set up to provide adequate treatment at a price they can afford.

Soon the provisions of the "Draft Act" will become operative, calling to the colors for training hundreds of thousands of men. This vast movement of population will result in young men leaving their homes for cantonments, naval concentrations, and industrial centers, where they will be confronted with new situations and meet new problems. They will be exploited when possible. The worst of the exploiters will be the prostitute and her chief of staff—that miserable human parasite, the pimp.

The younger members of this Association may think this is an exaggeration of the need for a strenuous program of law enforcement against commercialized prostitution, or that this is a new situation. Far from it.

In order that a clearer conception of the present problem may be had, a brief review of the incidence of venereal disease in the Army, Navy, and Marine Corps, in the Word War period is indicated. Due to the combined efforts of the Army, Navy, the American Social Hygiene Association, the law enforcement officials, and the other coöperating agencies, the American Army achieved the lowest venereal disease rate of any military force engaged in that upheaval. Despite that record, there was a shocking loss of man power. There were 100,000 more new cases of venereal diseases than wounds in battle. The Army lost 6,804,818 sick days.[2] This may be made more impressive by stating that it is equivalent to the absence of nearly 19,000 men for a whole year.

The Navy and Marine Corps had 57,146 venereal disease cases in 1917 and 1918, with a loss of 687,792 sick days.[3] This loss is equivalent to the absence of almost 1,900 men for a year. Expressed in terms of ship complement, the number of men necessary to man an aircraft carrier and the tugs to warp such a ship into her berth.

It is important to recognize that the data quoted represent the reported cases. How many men escaped detection and were able to conceal their infections has long been a matter of speculation by serious thinkers on the venereal disease problem.

History clearly shows that wherever armies go, there goes prostitution and venereal disease. Much of the above damage can be attributed to commercial prostitution. We have records of more than 33 centuries of punitive effort at control of venereal disease, and every page of this record is splotched with stupidity: Phinehas's murder of the Israelite Zimri and the Midianitish woman Cozbi removed one whore lady from the camp and one soldier who probably was infected, but not soon enough to prevent the reported loss of "twenty and four thousand" who died of the plague.[4]

It is both annoying and astonishing to the naval officer to learn how few of the well informed people in this country recognize that the Navy is one of the nation's large employers of labor —over 100,000—and that each of our industrial Navy Yards is a highly integrated industrial organization.

These naval establishments are manned by civil service personnel and it is by their skillful service that many of our ships are built and most of our repairs are effected. The effectiveness of the sea-going Navy is directly dependent upon the efficiency of the shore establishments, and anything which lowers

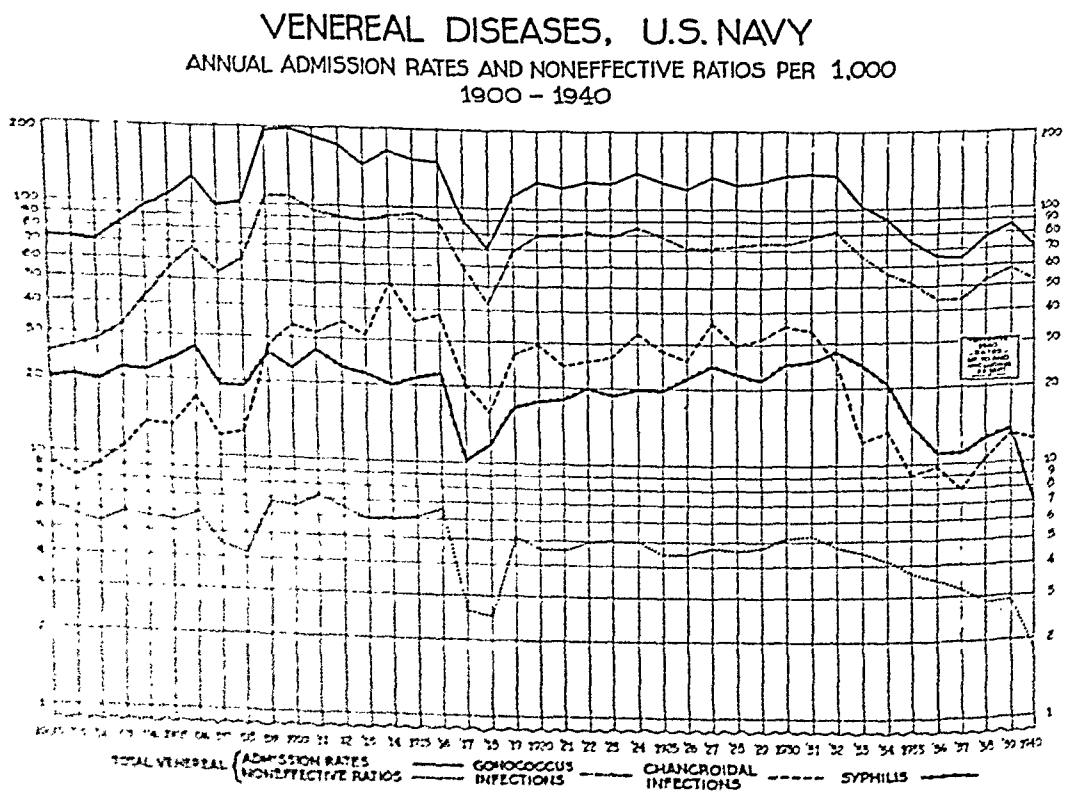


Fig 1

TABLE 1

TEN YEAR GONORRHEA STUDY, U. S. NAVY

Rates per 1,000 According To Cities Which Are Naval Ports

Cities in U. S. Listed in Descending Order of 10 Yr. Rate per 1000	*1929*	*1930*	*1931*	*1932*	*1933*	*1934*	*1935*	*1936*	*1937*	*1938*	*10 Year Rate*
New Orleans, La.	135.71	194.69	89.04	48.39	50.00						106.24
San Francisco, Calif.	115.14	68.58	223.53	68.18	53.66	48.04	22.65	9.92	20.80	38.46	60.29
Norfolk, Va.	47.65	51.90	54.73	51.18	47.17	36.80	46.36	38.80	30.25	35.44	43.10
Philadelphia, Pa.	45.11	50.43	62.95	60.29	31.53	12.60	32.38	36.67	21.30	23.48	38.05
Boston, Mass.	51.17	51.51	49.46	56.06	56.20	25.30	19.70	18.94	17.63	17.24	37.78
Bremerton, Wash.	46.14	45.07	54.20	28.75	28.62	47.62	31.89	24.79	15.56	22.50	34.97
Pensacola, Fla.	48.12	40.33	33.48	34.68	42.99	33.23	35.49	25.34	19.90	34.91	33.02
Charleston, S. C.	36.27	46.15	41.18	34.48	48.05	40.70	25.83	14.41	17.01	9.97	32.03
Quantico, Va.	40.70	28.27	44.28	44.32	37.95	33.90	33.59	20.16	24.69	18.20	30.81
San Diego, Calif.	29.90	20.87	28.26	44.46	40.44	29.47	24.35	24.01	28.30	27.50	29.14
New York, N. Y.	32.72	42.05	40.06	37.86	21.94	16.41	22.47	19.01	16.87	18.36	28.68
Seattle, Wash.				13.16		23.26	9.35	24.39	33.43	47.01	28.12
Mare Is. (Cal. Vallejo)	20.62	19.67	49.59	50.29	18.32	17.77	20.63	27.55	15.82	21.23	26.00
Washington, D. C.	40.55	51.25	30.30	23.11	26.50	25.93	29.04	13.97	15.04	12.04	25.59
Great Lakes (Chicago)	56.22	45.14	38.38	28.04	17.30	28.99	7.24	9.80	7.62	5.49	25.48
New London, Conn.	45.99	34.17	35.03	33.33	21.95	5.63	22.19	21.28	22.70	10.50	25.38
Parris Is., S. C.	27.01	46.52	43.30	14.40	18.66	9.73	14.40	5.55	7.05	10.45	24.53
Portsmouth, N. H.	23.75	25.75	21.33	28.95	15.87	24.76	15.66	14.73	22.73	7.92	20.84
Newport, R. I.	23.01	24.36	32.49	25.62	25.12	14.84	15.74	14.89	5.69	8.56	18.32
Annapolis, Md.	10.08	4.88	7.24	9.75	7.62	10.25	13.03	12.64	21.00	17.65	11.61
Total	36.51	35.11	40.58	39.05	31.42	26.99	27.17	22.65	21.71	23.17	30.11

the efficiency of the civil service personnel may have a serious effect on the fighting efficiency of the Navy.

The civil service personnel is physically examined prior to employment. Those applicants with active gonorrhea or chancroidal infections are rejected. Eligibility for employment is suspended until such time as cure has been effected. Evidence of cure must be established when examined for employment. Civil service employees discovered with active communicable venereal disease are advised to consult physicians for treatment and are not qualified for employment during the period of infectivity

Applicants for employment who give a history of syphilis, or who show clinical signs of this disease, are rejected, and their eligibility is suspended until evidence has been submitted showing 2 years' adequate treatment.

These and other administrative provisions insure that nobody knows the whole story of venereal diseases in the civil service personnel.

The admission rates for the years 1900–1940 for the Navy are depicted in Figure 1. It might be logical to assume the same rate for the civil service personnel as that reported for the Navy, since they reside near the several Naval Stations.

Time has not been available for a complete study of syphilis and chancroid according to the cities which are naval ports.

In Table 1, from "Ten Year Gonorrhea Study, U. S. Navy" [5] are shown incidence, rates per 1,000, and cities in the United States, listed in descending order of a 10 year rate per 1,000.

In Table 2 are shown the rates per 1,000 in cities outside the United States which are regular ports of call of the United States Navy.[5] The cities are listed in descending order of a 10 year rate.

The sailor and marine, like the civil service employee, are physically examined prior to entry into the service, and only those free from venereal disease

TABLE 2

TEN YEAR GONORRHEA STUDY, U. S. NAVY

Rates per 1,000 According To Cities Which Are Naval Ports

Cities. Navy Ports Outside Continental U. S. Listed in Descending Order of 10 Yr. Rate per 1,000	*1929*	*1930*	*1931*	*1932*	*1933*	*1934*	*1935*	*1936*	*1937*	*1938*	*10 Year Rate*
Sitka, Alaska										230.77	126.76
Shanghai, China	151.54	155.19	124.04	190.38	111.60	65.05	76.92	84.48	88.22	118.68	116.30
Peiping & Tientsin, (China)	163.21	174.51	226.74	186.35	96.65	48.74	76.77	55.77	76.07	55.56	114.43
Manila Area	31.75	66.67	86.68	10.24	58.77	37.76	32.26	57.46	84.30	91.84	64.25
Guantanamo Bay, Cuba	25.48	35.91	69.77	65.27	61.76	78.65	55.90	57.51	16.29	74.07	53.77
Coco Solo, C. Z. (Colon Area)	67.25	37.48	37.98	42.55	21.11	24.42	29.65	22.56	36.36	60.87	38.12
Tutuila, Samoa	19.80	80.00	40.00	22.60	89.89		92.78	34.09	18.18	11.43	36.13
San Juan, P. R.		18.52	54.55		36.36						27.52
St. Thomas, V. I.	61.45	38.46	15.79			66.67					24.94
Pearl Harbor, T. H. (Honolulu Area)	21.30	32.06	36.64	25.73	26.15	16.38	20.15	23.41	18.06	14.20	22.80
Balboa, C. Z. (Panama City Area)										12.05	6.02
Total	64.52	71.80	74.74	84.70	54.17	35.77	38.25	40.39	44.53	57.91	56.29

are accepted. A continuous effort is made to keep these people from becoming infected. Despite this effort men do become infected and sometimes the rate of infection reaches alarming proportions. These infections are acquired from the civil population in the ports of call, and the venereal disease rate in the Navy is an index of the venereal disease conditions in the cities which are naval ports.

The strength of civil service personnel is already greater than at any time during the World War, and the strength of the Navy and Marine Corps will soon exceed the average strength of 1917.

No man can predict how large the Navy will eventually become, but we can predict with a great deal of accuracy how many cases of venereal disease will occur in the Navy and civil service personnel unless a tremendous effort is made in the civil communities to place the infected population under treatment and to keep them under treatment until they are no longer infective. It is time to start a vigorous campaign of law enforcement to suppress commercialized prostitution: treatment of infected persons—enforced if necessary; and a sensible plan for rehabilitation of the prostitute.

Parran's "Platform for Action" in his *Shadow on the Land*[6] should be immediately implemented with men and money in order to conserve the health of the civil community and promote the efficiency of the Navy.

Venereal disease is preventable. The cost of cure is greater than the cost of prevention.

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NOTE: The opinions or assertions contained herein are the private ones of the writer and are not to be construed as official or reflecting the views of the Navy Department or the Naval Service at large.

Experience of the Army and Civilian Conservation Corps in Handling Newly Mobilized Men*

LT. COL. ARTHUR PARKER HITCHENS, M.D., F.A.P.H.A.

Medical Corps, U. S. Army, and Professor of Public Health and Preventive Medicine, University of Pennsylvania, Philadelphia, Pa.

"Dr. George Eric Barnstorff . . . told me . . . that medical treatment in camps is not as unskilled and irregular as people think, and that . . . troops . . . have skillful doctors furnished with an ample supply of medicines . . . and they pay these doctors large salaries." (Ramazzini, Bernardini. *De Morbis Artificum.*[1])

WITH the signing of the Selective Service Act (on September 16, 1940), this peace loving nation of ours willingly commenced the mobilization of its man power for that total effort toward strength which recent world events have made imperative.

As Parran[2] says: "The needs to be met are enormous in scope yet simple in analysis. National strength can be built up only by the adequate application of all the sciences to the provision of armament, munitions and supplies, food and man power. Our job is man power."

In order that this "man power job" may be accomplished, the Army will need from 15,000 to 40,000 commissioned officers in the Medical Department. This means the mobilization of a high proportion of medical men from all parts of the country and does not take account of the nurses, laboratory technicians, and sanitarians whose services are also essential.

A most important function of Army medical officers is that of making the physical examinations of men whose names are drawn in the Selective Service process. Only the best can be accepted for training; only those men are worth training who have the intelligence to learn the multitudinous tasks of the soldier and who have or can develop the physical strength to perform these rigorous duties under conditions of adversity. A weakling at the front is worse than useless.

Of the 900,000 men who hold the first numbers drawn it is predicted that a larger percentage will be found fit for the military service than in the mobilization for the World War.

We have made advances in our knowledge of diseases which cause disability and in their control during the past twenty years, and we think there has been a significant diminution in their incidence. To the experiences of the World War have been added the information that has been gained through

* Read at a General Session on "Communicable Disease Control Under Wartime Conditions" of the American Public Health Association at the Sixty-ninth Annual Meeting in Detroit, Mich., October 11, 1940.

work in camps of the Civilian Conservation Corps. In many civilian communities dental health programs have been made effective and nutrition has not only been well taught but has likewise been demonstrated to pupils by serving a balanced, adequate midday meal in the more intelligently supported public schools. Through the application of pasteurization, milk has been made safer and the consumption of this best of all foods has thereby increased. Surveys are taking a prominent place in case finding activities designed to aid in the control of tuberculosis and syphilis.

The country-wide compaign for the control of venereal disease initiated and fostered by the Public Health Service may be extended, during this mobilization to groups difficult to reach under ordinary circumstances. It is hoped that a serological test for syphilis may be made upon every man whose number is drawn—whether he is able to pass the physical examination or not. The incidence of syphilis, it seems likely, would be higher among those rejected, and an opportunity might be lost if only registrants were tested.

The problem of tuberculosis is in some ways similar to that of syphilis. Because of the time required for a tuberculin test and for a roentgenogram of the chest, these procedures will not be applied until the registrant is inducted and has reached his reception center. Men who show any evidence of pulmonary tuberculosis upon the x-ray examination will be discharged on certificate of disability.

Civilian communities have a great opportunity in this mobilization to find tuberculous men of draft age. The need is that money be made available to carry out the tuberculin test on all men selected and to x-ray the chests of all positives. Such a plan would not be worth much without the provision likewise for adequate care of all tuberculous men found. Parran[2] tells us "that Hitler has put all his active tuberculous together in factories to give—between dying coughs—a few months of service in munition making. If we plan well now, we shall not need such suicide squads for bomb manufacture. Segregate, yes; but let us restore also."

After the physical examination, those passed by the surgeons will be sent to reception centers for equipment and training. Here men between 21 and 35 years of age of every race and from all walks of life will meet, and here the important function of the doctors will concern the control of communicable disease. Those physicians who have been recently inducted into the service from civil life may for the first time have their main interest transferred from the treatment of the individual case to the protection of the group. The problem will not be any less that of hastening recovery, but the chief effort will be concentrated upon ascertaining the source of the infection in order to add that information to all other available knowledge that can be used to stop its spread.

We know that, as Zinsser[5] stated, "It is almost inevitable, when large numbers of men from all over the country are brought together in camps under circumstances that call for arduous physical and disciplinary training, that the outbreak of epidemics must follow."

What are the epidemic diseases, then, for which we must try to prepare? Let us catalogue them and review briefly the knowledge we have of their prevalence in the World War and possibly in previous wars; then let us attempt to estimate our ability to deal with them should they again appear among us.

INTESTINAL INFECTIONS

With even better methods for water purification than we had in the World War, with TAB vaccination compulsory, with careful attention to fly control, the exclusive use of pasteurized milk, and

rigid attention to refuse and sewage disposal, there should be a minimal number of cases of typhoid fever and other bacillary intestinal infections during this mobilization. An undetected carrier will always be a menace, especially if he is a food handler. In the World War there were only 1,529 primary admissions for typhoid fever.

VENEREAL DISEASES

Increased prevalence of venereal disease is always an accompaniment of mobilization. It will continue to be so until we begin to apply to its control the knowledge we actually possess. Hillman [3] states: "It is reported that during the first World War there were 400,000 cases in the British forces in France. There were 340,000 reported cases in the American Army. To state it differently, one man in every eleven acquired syphilis, gonorrhea, or chancroidal infection." The venereal diseases ranked second only to influenza as a cause of lost time.

Every medical officer knows that the punitive measures which were designed to make soldiers continent, and failing that, careful, had thorough trial. Too frequently they caused the young soldier upon finding himself infected to seek the advice of a patent medicine vendor or a charlatan, with the hope that he could thus avoid turning himself in and taking the punishment prescribed by Army Regulations.

At present the infected soldier loses pay while he is away from duty because of his disease but suffers court-martial only if he fails to report for treatment. In addition, the responsible Army medical officer will now receive effective cooperation of local police and extracantonment health officials. Any person known to be a source of infection will be kept in confinement until made noninfectious by treatment.

Those who contract gonorrhea will lose less time than formerly, it is believed, because prompt treatment with the newer remedies is much more efficient than with those in use during the World War.

RESPIRATORY INFECTIONS

No account of the pandemic of influenza could exaggerate its devastating effects upon the Army in 1918 and 1919. The three respiratory diseases, influenza, bronchitis, and pneumonia were responsible for over one million admissions to hospital and 44,000 deaths. Of the grand total of the admissions for disease this represented one-third, and 80 per cent of the deaths due to disease.

For treatment of the pneumonias we now have drugs which are highly efficient, so that whatever the incidence of these diseases may be during this mobilization, death rates will be lower than ever before. During the war period the death rate in our Army for all the pneumonias was about 24 per cent; during the 5 year period 1935–1939, it was 5.6 per cent; during about 6 months from October 1, 1939, it was less than 1.6 per cent.

Medical officers will not need to be reminded that for the minor respiratory infections, such as common colds and tracheobronchitis, early diagnosis, rest in bed, and plenty of warm nourishing fluids are as beneficial to Army as to civilian patients and may be the determining influence in preventing secondary pneumonias. Furthermore, in the care of large aggregations of men such matters as attention to cleanliness of the environment, adequate washing of eating utensils, and avoidance of close contact while sleeping in properly ventilated quarters, are among the important duties of medical officers.

We have been discussing the infections which are of greatest concern in civil practice. It is necessary to remember that an army is mobilized for a specific purpose and that purpose requires men in such perfect physical con-

dition that the military commander can depend on them. Everything must give way to the exigencies of the military emergency. This is the reason the Army medical officer has reason to fear epidemics which scarcely cause the civilian health officer even perfunctory consideration. Among these diseases are measles and mumps.

Measles began to sweep through the camps in this country almost immediately after their establishment. According to Zinsser[5] this was true particularly during the last 3 months of 1917, when it was responsible for a great many deaths. Continuing, he says: " For the year 1917, this disease stood first as a cause of disability for enlisted men, with a total of 974 deaths. . . . Since uncomplicated measles rarely kills, the death rate does not give a fair estimate of disability and therefore of the extent of military ineffectiveness for which this disease was responsible. This is more apparent from the morbidity which was 38,846 for troops in this country."

Mumps is not a dangerous disease but it is obviously a serious impediment to the speed of training, to say nothing of the immense burden it places on hospitals and medical resources. Among enlisted men serving in the United States during 1918 there were 102,950 cases.

Diphtheria was of military importance in this country in only two of our divisions. There were 3,305 cases in the United States, with 123 deaths.

Meningococcus meningitis was prevalent in several of our camps, especially during the winter of 1917–1918. I had the opportunity to study the outbreaks at Camps Jackson, Beauregard, and Funston, among others. Among the enlisted men in this country there were 1,720 cases. This disease is important because of its high death rate which was close to 40 per cent. The opportunity has also been afforded me to study outbreaks in two CCC camps—one in northern Wisconsin and one in Virginia, as well as in two civil institutions. I think we cannot claim even now that we know how to handle an outbreak of meningitis satisfactorily. Fortunately, with early diagnosis and with large intravenous doses of specific serum and the immediate commencement of treatment with one of the efficient new drugs, the death rate will be greatly reduced.

ULTRA-VIOLET IRRADIATION IN THE CONTROL OF RESPIRATORY DISEASE

Some years ago W. F. Wells began to study air-borne infection and the germicidal effect of ultra-violet radiation on bacteria floating in the atmosphere. He found that the heavier droplets of saliva thrown out in coughing or sneezing—or in ordinary talking—soon fall to the floor and become relatively unimportant in causing infection. The smaller droplets—those below a certain measured size—many of them containing bacteria, continue to float in the air and soon evaporate leaving their bacteria suspended. The bacteria and tiny dust particles left floating in the air, Wells calls the droplet nuclei; they are so light in weight they have little tendency to be precipitated. It is chiefly thus that pathogens become responsible for air-borne infections.

Wells has shown in many laboratory experiments that proper doses of ultra-violet radiation are able to kill such suspended bacteria. Experiments have been made with hemolytic streptococci, pneumococci, tubercle bacilli, and influenza virus. Much of this work is still experimental and is being repeated, but the practical deductions seem clear.

In addition to the laboratory research, practical studies have been under way in schoolrooms, hospital wards, operating rooms, and institutions for a sufficient time to indicate the value of the ultra-violet lamps—*when the installation is adequate*—in the control of respiratory infection.

It is likely that such studies will be

made in Army barracks. If the results are equal to present indications, we shall have in our hands a new instrument for the control of respiratory infections. Then we may expect to find the lamps installed in barrack rooms, mess halls, classrooms, motion picture theatres, and other confined spaces wherever men congregate.

In this brief review no attempt at thoroughness has been made. If our soldiers leave the confines of the United States they may be confronted with a host of other diseases. Even here we must have in mind conditions due to the protozoa, such as malaria and amebic dysentery, and diseases transmitted by animal carriers, such as the rickettsia and Asiatic plague and yellow fever.

We think there is reason to believe that morbidity and mortality rates among our troops during this mobilization will be reduced to figures even below those of the fine record made in the World War—if we may exclude influenza—and that the incidence of preventable disease will be less among our soldiers than among the civilian population of the same age groups.

If this is true, it will result from the more efficient application of our knowledge of disease prevention in the Army than is customary in civil life. Inherent in this is an indication so clear it amounts to a certainty that this mobilization will have a beneficial effect upon the health of our entire population by accelerating compliance with sanitary regulations—an achievement whose good results will be manifest among us during many years into the future.

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Present Status of Knowledge Concerning Influenza*

FRANK L. HORSFALL, JR., M.D.

Laboratories of the International Health Division of The Rockefeller Foundation, New York, N. Y.

SINCE ancient times a rather ill-defined symptom-complex usually characterized by sudden onset, fever, headache, chills, muscular pains, and cough has been observed by physicians. It has often appeared in epidemic form, particularly during winter months, and at widely separated intervals has been pandemic. It has been described frequently and variously and occasionally has been almost forgotten.

The name "influenza" which now is usually assigned to this disease, or group of diseases, derives from an Italian term first used in the 17th Century which meant literally "an influence of the stars." Until much more is learned concerning the nature of "influenza," it seems well to advocate adherence to this medieval name.

In the last three decades a number of different agents have been hailed as the cause of this disease. It was not until 1933, however, that an etiological agent was discovered which satisfied certain essential criteria. In that year Smith, Andrewes, and Laidlaw [1] recovered a virus pathogenic for ferrets from the throat washings of patients with influenza and demonstrated that antibodies against this virus were produced during convalescence from the disease. This discovery was confirmed the following year by Francis [2] and subsequently by many other investigators too numerous to mention individually.

The isolation and characterization of this virus formed the foundation for a great deal of subsequent investigation. Numerous epidemics of influenza have been studied in various countries throughout the world in the past 7 years. A very large number of strains of this virus have been recovered from patients with the disease, and the experimental evidence indicating an etiological relationship is now overwhelming. Moreover, Smorodintseff, *et al.*,[3] in very courageous experiments seem actually to have produced influenza by intranasal instillation of the virus in human volunteers.

Although there can be almost no reasonable basis on which to doubt the evidence that this virus has caused many epidemics of influenza in the last 7 years, there is equally good evidence that this virus has not caused all epidemics of the disease during the same period.

In 1936, Francis [4] studied a large epidemic of influenza in California and failed to recover this virus. Moreover, there was no demonstrable increase in antibodies against the virus during con-

* Read before the Laboratory Section of the American Public Health Association at the Sixty-ninth Annual Meeting in Detroit, Mich., October 10, 1940.

valescence from this disease. In 1939, Stuart-Harris, Smith, and Andrewes [5] likewise failed to recover the virus from many cases in England which they considered to be clinically typical of influenza. These patients also did not show any increase in neutralizing antibodies during convalescence. In 1940 we could not recover this virus from throat washings obtained from frank cases of influenza in a large epidemic in North Carolina; nor did these patients have any antibody response to the virus following their disease.

The results which have been obtained by various workers in different epidemics, in some of which the etiological relationship of the virus was regularly demonstrable while in others no etiological connection could be shown, strongly suggest that epidemics of influenza may not always be caused by one and the same agent. At the present time no pathognomonic signs or symptoms have been established which would serve to distinguish cases of influenza of known etiology from cases of influenza of unknown cause. Despite the fact that the various clinical and epidemiological manifestations of the disease may be nearly identical in two separate epidemics, it does not follow that the causal agents are similar or related.

The relative frequency with which epidemics of influenza are caused by the virus or are of unknown cause has not been determined, and insufficient data are available to assist in forming an opinion. However, the number of epidemics which were shown to have been caused by this virus during the 7 years since its discovery makes it obviously an important causal agent. Whether or not it is the most important cause, or even the most frequent cause, must await the investigation of numerous epidemics in the future.

Because some epidemics of influenza are caused by a known virus and others are still of unknown cause, it seemed advisable recently to adopt a more precise terminology than has been used heretofore. The workers associated with influenza research at the Laboratories of the International Health Division of The Rockefeller Foundation, New York, and at the National Institute for Medical Research, London,[6] have agreed to use a nomenclature which is specific in terms of present knowledge and capable of logical expansion as additional facts are unearthed.

Suggested Nomenclature

Clinical influenza—An etiologically indefinite symptom-complex characterized by clinical manifestations which in recent years have been enumerated and described by numerous authors.[4-9]

Influenza A—A specific disease caused by infection with any strain of the virus discovered by Smith, Andrewes, and Laidlaw [1] which will be termed influenza A virus.

The separation of influenza A from clinical influenza leaves a disease or group of diseases clinically resembling it but as yet of unknown etiology. If hitherto undescribed viruses are isolated from this group and shown to be etiologically related, other specific diseases in the group could be labeled influenza B, C, etc.

Influenza virus

Influenza A virus—The virus discovered by Smith, Andrewes, and Laidlaw,[1] which was originally termed "influenza virus," or "human influenza virus," and more recently "epidemic influenza virus." If other "influenza viruses" are isolated they could be labeled influenza B virus, C virus, etc., to correspond with the diseases influenza B, C, etc.

It is hoped that this nomenclature will be useful in the communication of a number of concepts which previously have not been assigned definitive terms.

Throughout the remainder of this paper this suggested nomenclature will be used.

What follows will deal merely with influenza A and its cause, influenza A virus, since information regarding the other influenzas is as yet only negative in character.

Because influenza A cannot yet be diagnosed certainly on clinical grounds alone, the diagnosis rests upon laboratory evidence. The most conclusive evidence is available when influenza A virus has been recovered from the throat washing of a given case and an increase in antibodies against the virus demonstrated in the serum of the same patient. Such evidence is difficult to obtain, and even in the most thoroughly equipped laboratories with highly trained personnel only a small percentage of cases in a large epidemic can be studied with this degree of thoroughness. The recovery and identification of influenza A virus from a given throat washing require considerable time and, even under the most favorable circumstances, cannot yet be accomplished in less than 3 weeks. The serological tests offer easier and somewhat more rapid methods of specific diagnosis. In the case of either the complement-fixation or the neutralization test, however, sufficient time must elapse between the onset of the disease and the day on which the convalescent serum is obtained for the production of additional antibodies by patients infected with the virus. Given ideal conditions, it is possible to obtain evidence of an increase in specific antibodies by means of the complement-fixation test in from 10 days to 2 weeks after the beginning of an epidemic. With the neutralization test a similar result can be achieved only within 3 weeks of the onset because of the additional time required for the observation of the test mice.

In comparison with the speed with which an accurate etiological diagnosis can be made in the case of many bacterial infections, notably in the pneumococcus pneumonias, the time required for an exact diagnosis of influenza A seems very protracted. Nonetheless, the available methods are among the most rapid in the field of virus diseases. That this is true is due in great part to the relative rapidity with which patients produce additional antibodies against influenza A virus. It has recently been shown by Eaton and Rickard [10] and by Horsfall, Hahn, and Rickard [9] that both complement-fixing and virus-neutralizing antibodies reach maximum levels within 10 to 14 days after the onset of influenza A.

The complement-fixation test for antibodies against influenza A virus was originally described by Smith.[11] Comprehensive studies of the significance of the results obtained have been made by many workers. The comparative analyses of results with complement-fixation and neutralization tests made by Francis, Magill, Rickard, and Beck,[12] Eaton and Rickard,[10] and Rickard, Lennette, and Horsfall [13] leave no doubt as to the usefulness and accuracy of the method. Its advantage lies in the fact that it is an *in vitro* technic which can be carried out by almost any laboratory in which facilities for the Wassermann reaction are available. The only special material required is influenza A virus antigen. The hazards of the test lie in a too facile interpretation of results and in the possibility that antibodies directed against substances other than the virus or its derivatives in the crude antigen may lead to erroneous conclusions. Eaton and Rickard,[10] as well as Rickard, Lennette, and Horsfall,[13] showed that between 95 and 98 per cent of normal human beings possess serum which when diluted more than 1:4 will not fix complement with influenza A virus antigen. It was also shown by Eaton and Rickard [10] that the

serum of about 85 per cent of patients convalescent from proven influenza A could be diluted 1:16 or more and still fix complement with the antigen. Consequently, it is possible in most instances by this method to demonstrate a titer of antibodies higher than normal when only the convalescent serum is available, provided the technic as described is followed exactly. However, to base a specific diagnosis on a single serum specimen is a hazardous procedure even in laboratories which regularly use this test, and it is preferable that both acute-phase and convalescent sera be obtained from individual patients and compared in the same test. Under these circumstances there is good evidence that the test gives accurate and reproducible results which may permit the establishment of an exact diagnosis. There is no evidence which indicates that any disease other than influenza A causes an increase in complement-fixing antibodies against influenza A virus.

The determination of the titer of antibodies against influenza A virus by means of the neutralization test in mice was first described by Laidlaw, Smith, Andrewes, and Dunkin.[14] The technic has been modified and improved considerably by various workers, but basically it has remained unchanged. Serial dilutions of serum are mixed with a constant amount of virus, and each mixture is tested by the intranasal inoculation of a group of lightly anesthetized mice. It has been thoroughly demonstrated by Andrewes, Laidlaw, and Smith,[15] Francis and Magill,[16] and Horsfall [17] that this test can be made very accurate. The reproducibility of neutralizing antibody titers when the test is carefully standardized probably is higher than has been achieved with any other animal virus.

When the neutralization test is used to determine whether an increase in antibodies against influenza A virus has occurred following an attack of clinical influenza, it is essential that two serum specimens be available from each patient. The first serum should be taken during the acute phase of the disease, not later than the 5th day, and the second serum should be taken 2 weeks after onset, although any time between the 2nd and 5th week is satisfactory. A significant antibody rise diagnostic of infection by influenza A virus can be considered demonstrated when the neutralizing titer of the convalescent serum is four or more times higher than the titer of the acute-phase serum. Unfortunately, there is no critical neutralizing antibody level which can be taken to indicate recent infection by the virus. It has even been found [13] that certain normal individuals possess antibody titers higher than some which are encountered in a few individuals convalescent from influenza A. It is of importance, therefore, to reëmphasize that both acute-phase and convalescent neutralizing antibody titers on the same individuals are essential if an accurate interpretation is to be made of the results. No evidence exists that any disease but influenza A results in an increase in neutralizing antibodies against influenza A virus.

The recovery of influenza A virus from throat washings is usually done by the intranasal inoculation of ferrets. Although various other experimental technics have been suggested, ferrets, which were used in the first isolation of the virus,[1] are for practical purposes still essential to the work. Francis and Magill [18, 19] succeeded in establishing the virus directly in mice, tissue culture, and on the chorio-allantoic membrane of the developing chick embryo without preliminary ferret passage. Despite the obvious significance of these experiments, the technics do not simplify the recovery of the virus from throat washings, and it is now known that they are successful only with a small proportion of washings which can be shown to

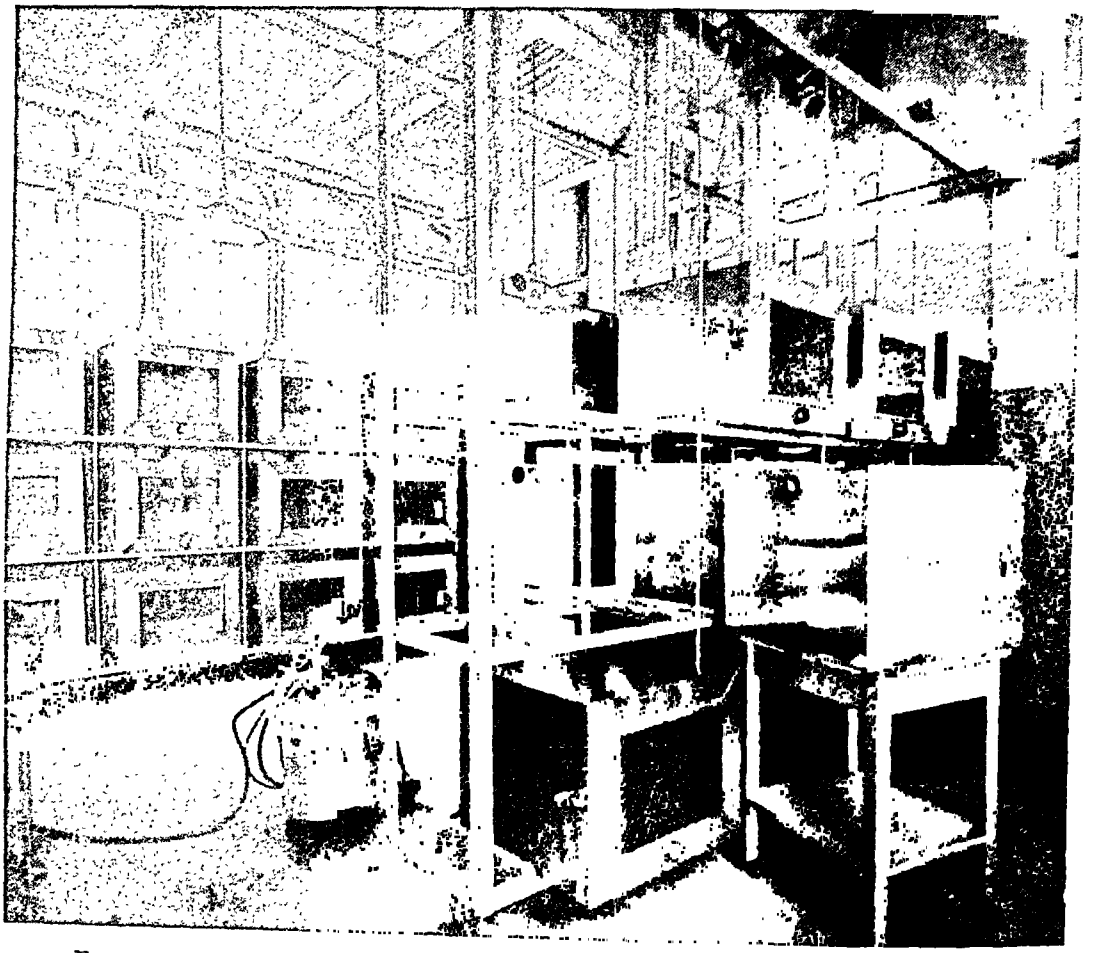


FIGURE 1—Interior of isolation room. Two cubicles have been removed from one of the banks in the center of the room to show the openings in a vertical duct for ventilation of the cubicles. The exhaust end of the main ventilating duct at the window is visible.

contain the virus by ferret inoculation. The costliness of ferrets, along with the fact that they must be strictly isolated to prevent contact infections from either influenza A virus or canine distemper virus, makes experimentation with them a complicated procedure.

Equipment suitable for the individual isolation of a number of infected animals in a single room has recently been designed and constructed by Horsfall and Bauer.[20] Each experimental animal is confined in a relatively airtight metal cubicle through which filtered air is drawn by forced draft. Each cubicle can be disconnected from the ventilating system without being opened, and removed to another room for experimental procedures. The details of this isolation unit are shown in Figure 1. Unless inoculated ferrets are strictly isolated it is not possible to be sure that viruses recovered by their use were actually contained in given throat washings.

Taylor [21] has recently shown that the Syrian hamster could be infected with throat washings known to contain influenza A virus. Although these animals did not develop symptoms or signs indicative of infection, they did rapidly produce neutralizing antibodies against the virus. If subsequent investigation should show these animals to be approximately as susceptible as the ferret, and if they are not readily infected by contact, which seems prob-

able, their small size, low cost, and insusceptibility to distemper should make them exceedingly useful as a substitute for the ferret. Finally, it should be emphasized that no rapid or simple method has yet been devised for the demonstration of influenza A virus in a given throat washing.

Influenza A virus as it occurs in the human disease is not pathogenic for mice. It can, however, be caused to develop pathogenicity for this species as was shown independently by Andrewes, Laidlaw, and Smith,[22] and by Francis.[2] Serial passage through ferrets appears to make the virus more readily adaptable to mice. Even when a number of ferret passages have been carried out, the virus usually fails to cause lung lesions in the first mice inoculated. It is only after repeated passages in mice that full pathogenicity for this species is acquired. The discovery that mice could be used as experimental animals in investigations with influenza A virus made possible innumerable studies which could hardly have been accomplished using ferrets. The greater part of experimental studies are now carried out with so-called mouse-adapted strains of the virus.

A very large number of strains of influenza A virus have been recovered during the past 7 years. Initially it was thought that the first few strains recovered were antigenically identical. However, in 1936 Magill and Francis [23] showed that certain strains were different antigenically. This discovery was confirmed by Smith and Andrewes.[24] At the present time many different strains are known. All strains produce at least some slight degree of immunological cross-reaction with other strains, and the antigenic differences between them are quantitative rather than qualitative. However, in the case of certain strains the antigenic mosaic of one strain may contain only a small proportion of antigens common to another strain, and, as Horsfall and Lennette [25] have shown, ferrets recently convalescent from infection by the former strain may not be immune to reinfection by the latter strain.

Since cross-neutralization tests and cross-immunity tests in animals clearly indicate that there are antigenic differences between various strains of influenza A virus, it becomes of considerable importance, in order to evaluate evidences of immunity to influenza A in man, to know whether human beings manifest a relatively strain specific antibody response to a given attack of the disease or have a broader immunological response.

Magill and Sugg [26] have presented evidence indicating that human sera may have different neutralizing titers when tested against antigenically different strains. However, in experiments which are not yet published we have demonstrated that the rise in neutralizing antibody titer which follows influenza A is independent of the strain of virus used. It seems probable, therefore, that the human antibody response to infection by this virus is commonly not specific for the infecting strain and that infection by one strain may result in as broad an immunity to different strains of the virus as infection by another.

It is well known that many virus diseases are followed by a permanent immunity. Smallpox, poliomyelitis, and yellow fever are but a few examples. In those virus diseases which produce demonstrable antibodies it is usually true that the enduring immunity is associated with the persistence of circulating antibodies. There is good reason to think that the immunology of influenza A does not follow these generalities. Although two attacks of proven influenza A in the same individual have not yet been reported, there is no real reason to doubt that they will be observed. Certainly clinical in-

fluenza commonly attacks the same individuals repeatedly. The possession of neutralizing antibodies against influenza A virus is no assurance of immunity against the disease since, as is well established, at least 95 per cent of human beings have demonstrable antibodies. It has recently been shown by Rickard, Lennette, and Horsfall [13] that a definite correlation existed between preëpidemic neutralizing antibody titers and proven susceptibility to influenza A. During the 1939 epidemic it was found that the attack rate in the low titer group was 5 times and 8 times higher, respectively, than in the mid and high titer groups. This indicates that the higher the concentration of neutralizing antibodies, the greater is the probability of immunity to the disease.

The increased concentration of circulating antibodies which follows an attack of influenza A does not persist indefinitely but instead decreases progressively until after a period of between 8 months and a year the titer of antibodies has returned to almost the initial individual level. Francis, Magill, Rickard, and Beck [12] found that antibody titers declined about 50 per cent in from 2½ to 5 months after influenza A. We have recently determined the antibody titers of 15 individuals before and at frequent intervals after proven influenza A. The results are shown graphically in Figure 2.

One month after infection the mean neutralizing antibody titer in this group was 42 times higher than during the acute phase of the disease. Two months after infection it had declined considerably and was only 5 times higher than during the acute phase. At 3 months it was 2 times higher, while at 8 and 12 months it was only 1.5 and 1.3 times higher, respectively. On the basis of what is now known regarding the relation between neutralizing antibody titers and susceptibility to influenza A, it seems probable that approximately 25 per cent of the individuals studied could have been reinfected at 3 months, while about 60 per cent may have been

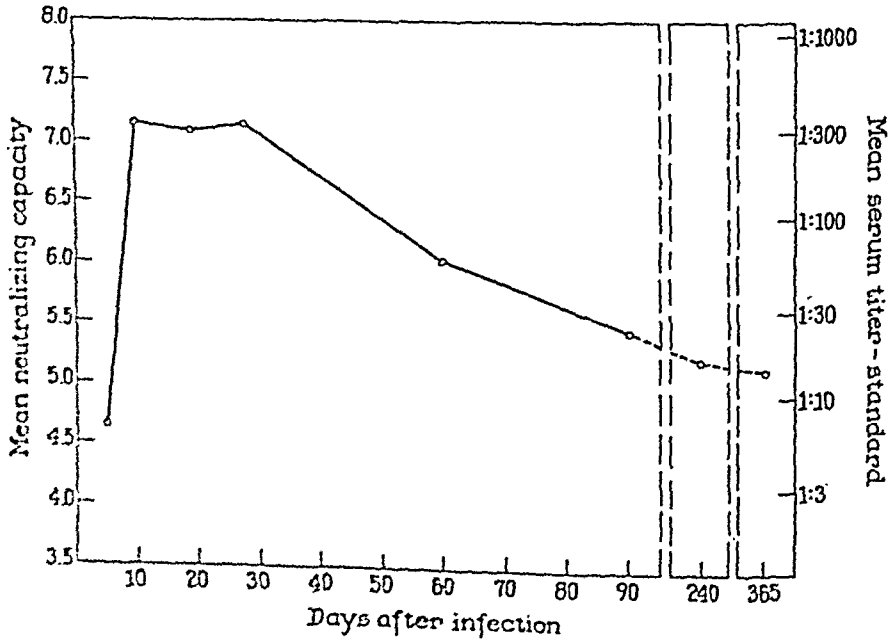


FIGURE 2.—Mean standard neutralizing titers of sera from 15 patients with proven influenza A at various intervals after the onset of the disease.

susceptible to reinfections at 8 months and 1 year. This leaves only 40 per cent of individuals who at the end of a year possessed a sufficiently increased antibody titer to make it likely that they would be immune to reinfection.

Persons in contact with patients suffering from influenza A may or may not develop the illness. However, many who do not develop clinical symptoms are nonetheless infected by the virus and have what may be termed subclinical infections. Francis, Magill, Rickard, and Beck [12] found that approximately 20 per cent of persons freely exposed to clinical cases of the disease subsequently developed an antibody response indicative of infection by the virus. Recently Horsfall, Hahn, and Rickard [9] found that nearly 30 per cent of contacts who remained perfectly well had actually been infected by the virus. It may well be that this group with inapparent infections are of much greater importance in spreading the disease than are those persons whose illness incapacitates them and thereby markedly reduces the number they might expose.

Numerous efforts have been made to prepare vaccines effective in producing active immunity to influenza A in man. Francis and Magill,[27] as well as Stokes, Chenoweth, Waltz, Gladen, and Shaw,[28] studied the efficacy of active tissue culture virus given parenterally to man. Stuart-Harris, Andrewes, and Smith [7] and Taylor and Dreguss [29] tested subcutaneously in man the effectiveness of formaldehyde-inactivated virus obtained from infected mouse lungs. Both types of vaccine appear to have stimulated the production of additional neutralizing antibodies against influenza A virus. When repeated injections of either vaccine were given, the resultant antibody response seems to have been almost comparable with that which follows a clinical attack of influenza A. Although numerous individuals who received either one type of vaccine or the other were followed carefully through epidemics of influenza A, no convincing evidence was obtained that either vaccine was effective in preventing the occurrence of the disease.

Recently it was reported by Horsfall and Lennette [30] that a formalinized complex vaccine containing both influenza A virus and canine distemper virus was very effective in the immunization of ferrets against antigenically different strains of the former virus. More recently it has been found in this laboratory that a similar formalinized complex vaccine prepared from chick embryos infected simultaneously with both influenza A virus and canine distemper virus was very effective in stimulating the production of additional neutralizing antibodies against influenza A virus after a single subcutaneous injection in man. Moreover, the increased antibody titers which resulted from the administration of this vaccine did not diminish during the first 3 months after vaccination. Experiments are now in progress to determine for how long a period these increased antibody titers will persist. It is well recognized that antibody levels may not necessarily reflect the actual immunizing potency of a vaccine and that the efficacy of a possible prophylactic agent can be determined accurately only by the study of comparable vaccinated and control groups of human beings exposed to an epidemic of proven influenza A.

In conclusion, it may be well to stress again that some epidemics of clinical influenza are still of unknown cause. Until the recovery of an etiological agent, or agents, from epidemics of this kind, our information concerning this group of diseases will remain very incomplete.

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Typhoid Vaccine Studies

Revaccination and Duration of Immunity*

DON LONGFELLOW, M.D., AND GEORGE F. LUIPPOLD

Major, Medical Corps, U. S. Army; and First Lieutenant, Sanitary Corps Reserve, U. S. Army, Washington, D. C.

FOLLOWING the work of Grinnell,[1,2] who used intraperitoneal injections into mice to study the relationship between the killing power of various strains of the typhoid bacillus to their effectiveness as immunogenic agents, and the subsequent extension of this line of research by Perry, Findlay, and Bensted,[3-6] who applied this same method to a similar study, an investigation along comparable lines was begun in the laboratories of the Army Medical School during the latter part of the year 1934.

A statistical study of the effectiveness of typhoid vaccines had been made earlier in the same year by Hawley and Simmons.[7] Since then, four progress reports of laboratory studies of typhoid vaccination have emanated from the laboratories of the Army Medical School.[8-11]

Early in this work, methods of technic were improved more nearly to validate interpretation of results obtained by such experimental work with mice, due to the introduction of gastric mucin as a vehicle for the test organism in mouse immunization experiments by Nungester *et al.*,[12] and by Miller,[13] and finally by its application to the mouse protection test for passive immunity to the typhoid bacillus by Rake.[14]

The third report emanating from the laboratories of the Army Medical School[10] in February, 1939, introduced a study of revaccination by intracutaneous injection of typhoid vaccine. Prior to this, Perry[15] reported "O" and "H" agglutinin responses in previously vaccinated individuals who were restimulated by intracutaneous injections of 0.1 cc. of vaccine; and recently, Tuft[16] reported a satisfactory response in 4 similar individuals similarly revaccinated, as evidence by both agglutination tests and serum protection tests—but adds that the "group was too small to warrant definite conclusions."

The report which follows is a continuation of the study announced by the laboratories of the Army Medical School in February, 1939,[10] and, as did this preliminary publication, includes a study of duration of immunity subsequent to vaccination along with further observations following revaccination by the intracutaneous injection of typhoid vaccine.

REVACCINATION

The usual method of revaccination is the same as for initial vaccination; that is, three subcutaneous doses—0.5 cc., 1.0 cc., and 1.0 cc., respectively—at approximately weekly intervals. (The

* From the Laboratories of the Army Medical School, Washington, D. C. Read at a Joint Session of the Laboratory and Epidemiology Sections of the American Public Health Association at the Sixty-ninth Annual Meeting in Detroit, Mich., October 11, 1940.

TABLE 1

Protective antibody content of blood sera of 189 individuals before revaccination and 14 days after revaccination with 0.1 cc. of typhoid vaccine intracutaneously. All had received only one course of vaccine from 2 to 3 years previously. Protection expressed as the number of minimum lethal doses of the test organism against which the serum protected mice.

Minimum Lethal Doses	Before Revaccination		14 Days After Revaccination	
	Number	Per cent	Number	Per cent
100,000			15	7.9
10,000	7	3.7	95	50.3
1,000	25	13.2	70	37.0
100	65	34.4	9	4.8
10	58	30.7		
1	34	17.0		
Total	189		189	

dosage cited is for vaccine containing 1,000 million organisms per cc.) This series of 3 doses constitutes a " standard course " of vaccination, and will hereafter be referred to as such. The " standard course " is prescribed for the military service, and military personnel are required to be revaccinated at 3 year intervals. Exemptions are granted after 2 courses at a 3 year interval, and to individuals over 45 years of age. This method is time consuming, requiring a minimum of 2 weeks and 3 separate visits to the doctor. Because of this, studies were undertaken to determine the efficacy of a single dose of vaccine administered to previously vaccinated individuals.

Intracutaneous administration — A group of 189 young adult males who had received one " standard course " of typhoid vaccine from 2 to 3 years previously, were selected. Each of these individuals was given 0.1 cc. of vaccine (100 million organisms) into the skin of the arm or forearm. The antibody content of the blood serum in each case was titrated by means of the mouse protection test immediately before and 14 days subsequent to this revaccination. (This test, as employed in this work, has been described in a previous communication.[9]) The results of this study are shown in Table 1.

The blood sera of all members of this group, after revaccination, protected

TABLE 2

Protective antibody content of blood sera of 51 individuals before revaccination and 14 days after revaccination with 0.5 cc. of typhoid vaccine subcutaneously. This group had received from 1 to 7 courses of vaccine, the last of which had been given from 2 to 20 years previously. Protection expressed as the number of minimum lethal doses of the test organism against which the serum protected mice.

Minimum Lethal Doses	Before Revaccination		14 Days After Revaccination	
	Number	Per cent	Number	Per cent
100,000				
10,000	1	2.0	23	45.1
1,000	5	9.8	24	47.1
100	27	52.9	4	7.8
10	12	24.0		
1	6	12.0		
Total	51		51	

mice against at least 100 m.l.d., and in 95 per cent of the cases against at least 1,000 m.l.d. of the test organisms.

Subcutaneous administration—In another group of 51 individuals, each was given 0.5 cc. of vaccine (500 million organisms) subcutaneously. Members of this group had received from 1 to 7 " standard courses " of vaccine, the last of which had been given from 2 to 20 years previously. The blood sera were titrated immediately before and 2 weeks subsequent to revaccination. The results of this study are shown in Table 2.

It will be seen that the blood sera of all members of this group, after revaccination, protected mice against at least 100 m.l.d., and in 92 per cent of the cases against at least 1,000 m.l.d. of the test organism.

In order to compare the results obtained in these two groups with the usual method of revaccination, 50 individuals who had received from 1 to 5 " standard courses " of vaccine were selected. In each case the last course had been given at least 2 years previously. Each member of this group was given a " standard course " of vaccine, and the blood serum of each individual was titrated immediately before and 2 weeks after administration of the 3rd dose of vaccine. The results of this study are shown in Table 3.

It will be seen that in all cases, after revaccination, the blood serum protected mice against at least 100 m.l.d., and in 96 per cent of the group the blood serum protected mice against at least 1,000 m.l.d. of the test organism.

The immunological response, as measured by the mouse protection test, is very much the same in all three methods of revaccination. The blood serum of all individuals in the three groups protected mice against at least 100 m.l.d. 2 weeks after revaccination, while 95 per cent of the first group (0.1 cc. intracutaneously), 92 per cent of the second group (0.5 cc. subcutaneously), and 96 per cent of the third group (" standard course "), protected against at least 1,000 m.l.d. of the test organism.

Reactions following the administration of 0.1 cc. of typhoid vaccine intracutaneously are relatively much less severe than those following subcutaneous administration. A considerable number of individuals who had been vaccinated two or more times previously, in addition to those who had been vaccinated only once before, have been revaccinated by the intracutaneous method (0.1 cc.). No severe reactions have been observed.

TABLE 3

Protective antibody content of blood sera of 50 persons before revaccination and 14 days after revaccination with 3 doses of typhoid vaccine. Members of this group had received from 1 to 5 courses of vaccine, the last of which was given 2 or more years prior to revaccination. Protection expressed as the number of minimum lethal doses of the test organism against which the serum protected mice.

Minimum Lethal Doses	*Protection Before Revaccination*		*Protection 2 Weeks After Revaccination*	
	Number	*Per cent*	*Number*	*Per cent*
100,000			8	16.0
10,000			31	62.0
1,000	14	28.0	9	18.0
100	16	32.0	2	4.0
10	13	26.0		
1	7	14.0		
Total	50		50	

The most severe systemic reactions noted consisted of some fever, mild malaise, headache and myalgia. In a study of 100 consecutive cases, involvement of the axillary lymph nodes, consisting of slight swelling and tenderness without suppuration, was observed in 46 per cent of the cases, headache in 20 per cent, and an elevation of body temperature in 8 per cent. The highest temperature noted was 101°. In many instances, those presenting these relatively mild reactions following the intracutaneous administration of vaccine gave a history of severe reactions following subcutaneous administration of the vaccine. The local reaction has usually consisted of an area of redness at the site of vaccination and in a few instances some swelling of the tissues.

DURATION OF IMMUNITY

No test is available which will determine definitely the amount of immunity to typhoid fever possessed by a given individual. The mouse protection test measures the circulating antibody content of the blood serum and to this extent measures the degree of immunity to natural infection. With this as the only available method of detecting the quality of the individual's immunity, an attempt was made to determine the duration of immunity subsequent to vaccination. Results of such determinations indicating an increase or a decrease in the antibody content of the blood serum may, for present purposes, be interpreted as a corresponding increase or decrease in the individual's immunity.

It is not known what degree of immunity, as measured by the mouse protection test, an individual must possess in order to protect him from natural infection by typhoid organisms. In studying this phase of the problem, a group of young adult males, who gave a negative history of typhoid fever and of typhoid vaccination, and were therefore, presumably, non-immune, was selected. The blood sera of 107 such individuals were titrated by the mouse protection test in such a way that both the lower and upper end points were determined—that is, the dosage of test organisms against which the serum protected all mice, and against which the serum *failed* to protect any mice. Of this group, the sera of 89, or 83 per cent, protected mice against 1 m.l.d. of the test organism, but not against 10 m.l.d.; the sera of 12, or 11 per cent, protected mice against 10 but not against 100 m.l.d.; and the sera of 6, or 6 per cent, protected mice against 100 m.l.d. of the test organism. It is probable that in any group of 100 such individuals, some would have acquired a certain degree of immunity due to casual contact with the infection, or by a mild, undiagnosed attack of typhoid fever. However, in 94 per cent of this group, the blood serum would not protect mice against 100 m.l.d. of the test organism.

It seemed probable that young children who have not had typhoid fever, who have not been vaccinated against the disease, and who, because of their age, have had little opportunity for casual contact with the infection, would be non-immune. With this in mind, the blood sera of 21 children were titrated by the mouse protection test. The ages of these children varied from 10 months to 7 years. The sera of 20 of the children failed to protect mice against 1 m.l.d. dose of the test organism; the serum of one child (3½ years of age) protected mice against 1, but not against 10 m.l.d., of the test organism.

Individuals convalescent from an attack of typhoid fever, and typhoid carriers, should have sufficient immunity to protect them from natural infection. The blood sera of 9 typhoid convalescents were titrated by the mouse protection test. In each instance, the nature of the infection was positively diagnosed as typhoid fever. The results

TABLE 4

Protective antibody content of blood sera of 9 typhoid fever convalescents. Protection expressed as the number of minimum lethal doses of the test organism against which the serum protected mice.

Minimum Lethal Doses	*No. of Persons*	*Per cent*
100,000	2	22.2
10,000	4	44.4
1,000	2	22.2
100	1	11.1
Total	9	

TABLE 5

Protective antibody content of blood sera of 10 typhoid carriers. Protection expressed as the number of minimum lethal doses of the test organism against which the serum protected mice.

Minimum Lethal Doses	*No. of Carriers*	*Per cent*
100,000	1	10.0
10,000	2	20.0
1,000	6	60.0
100	1	10.0
Total	10	

of this study are shown in Table 4.

In all of the 9 convalescents, the blood serum protected mice against at least 100 m.l.d., and the sera of 8 of them protected against at least 1,000 m.l.d. of the test organism.

The blood sera of 10 known carriers of *Eberthella typhosa* were titrated by the mouse protection test to determine the degree of immunity to typhoid fever possessed by this class of individuals. The results of this study are shown in Table 5.

The sera of all 10 of these carriers protected mice against at least 100 m.l.d., and in 9 of them the serum protected mice against at least 1,000 m.l.d. of the test organism.

The number of cases used in the studies of presumably non-immune children, typhoid convalescents, and typhoid carriers, is too small to justify conclusions of a statistical nature, but they do serve to indicate differences in the degree of immunity possessed by presumably non-immune individuals and by those who are immune.

In view of the results obtained in the studies described above, as well as those shown in Tables 6 and 7, it is believed that, as a working basis, an individual may be regarded as immune to ordinary typhoid infection when his blood serum will protect mice against 100 m.l.d. of a virulent organism. However, in the absence of more definite data, it is believed that this degree of immunity should be considered as the minimum necessary to protect against typhoid fever. Using this assumption, a study was made to determine the duration of immunity following the vaccination of individuals who had never been previously vaccinated and who gave no history of typhoid fever. All members of this group were young adult males. The results of this study are shown in Table 6.

This study shows that 12 to 18 months subsequent to the initial vaccination the blood sera of 20 per cent of the group did not protect mice against 100 m.l.d. of the test organism; that 2 years after vaccination the blood sera of 40 per cent of the group did not protect mice against 100 m.l.d.; and that 2½ to 3 years after vaccination the blood sera of 57 per cent of the group failed to protect mice against 100 m.l.d.

The studies on duration of immunity as described above concerned individuals who had been vaccinated only once. A study has also been made of the duration of immunity wherein two or more courses of typhoid vaccine had been given previously and wherein from 2 to 10 years or more had elapsed since the last revaccination. The results of this study are shown in Table 7.

TABLE 6

Protective antibody content of blood sera at different periods of time after vaccination. Members of this group had received one course of vaccine. Protection expressed as the number of minimum lethal doses of the test organism against which the serum protected mice.

Minimum Lethal Doses	2 Weeks After Initial Vaccination		12–18 Months After Initial Vaccination		2 Years After Initial Vaccination		2.5 to 3 Years After Initial Vaccination	
	No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent
100,000	39	26.17						
10,000	65	43.62	23	14.3	6	6.38	1	1.05
1,000	37	24.83	53	33.0	12	12.77	13	13.68
100	8	5.37	52	32.3	38	40.43	27	28.42
10			26	16.1	22	23.40	36	37.89
1			7	4.3	16	17.02	18	18.95
Total	149		161		94		95	

The number of cases in this study is too small to justify definite conclusions. Apparently, where the individuals have received two or more courses of vaccine, the group immunity tends to remain at a higher level for a longer time than when only one course of vaccine has been administered, but there is still a tendency toward relative decrease of immunity with time, even after several revaccinations.

The severity of reactions following the administration of typhoid vaccine when given subcutaneously tends to increase with the number of times the individual is revaccinated by this method, until severe reactions are a frequent occurrence among those who have been revaccinated a number of times. These studies indicate that when typhoid vaccine is given intracutaneously in a dose of 0.1 cc., severe reactions are extremely rare, even when individuals vaccinated by this method have been previously vaccinated a number of times. The data shown in Tables 6 and 7 indicate that while the decrease in immunity after several vaccinations is not as marked as that following one course only, nevertheless there is a considerable decrease

TABLE 7

Protective antibody content of blood sera at different periods of time subsequent to the last vaccination. Members of this group had received 2 or more courses of vaccine, and from 2 to 10 years or more had elapsed since the last vaccination. Protection expressed as the number of minimum lethal doses against which the serum protected mice.

Minimum Lethal Doses	Time Subsequent to Last Vaccination									
	2 Years		3 Years		4–5 Years		6–10 Years		10 Years+	
	No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent
10,000	2	7.69	3	9.38	4	11.11	4	7.70	1	2.94
1,000	7	26.92	12	37.50	16	44.44	18	34.62	8	23.53
100	8	30.77	11	34.37	8	22.22	17	32.69	11	32.36
10	7	26.92	6	18.75	8	22.22	10	19.23	9	26.47
1	2	7.69					3	5.77	5	14.7
Total	26		32		36		52		34	

in group immunity even though the members of the group have been vaccinated several times.

CONCLUSIONS

The following conclusions are based on results obtained by mouse protection tests, and on the assumption that these tests yield a reliable index to an individual's quality or degree of immunity.

1. Revaccination with a single dose of 0.1 cc. of vaccine intracutaneously administered constitutes a reliable method of renewing immunity to typhoid fever, and should be the method of choice.

2. Revaccination with a single dose of 0.5 cc. of vaccine subcutaneously administered also produces a satisfactory renewal of immunity to typhoid fever. This procedure should be considered as an alternative method when conditions preclude intracutaneous administration.

3. In order to maintain a high degree of immunity to typhoid fever, as indicated by humoral antibodies, revaccination at 1 year periods appears to be an advisable procedure. Certainly, it appears that the interval between revaccinations should not exceed 2 years. It may be added that revaccinations at the intervals recommended should not be discontinued because of age nor because of any number of previous revaccinations.

We wish to emphasize the fact that, at this time, we do not advocate any change in the method of *initial* vaccination—that is, with a " standard course " of vaccine. A study of methods of initial vaccination is now in progress in these laboratories.

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Human Relations as a Public Health Problem

HALBERT L. DUNN, M.D., PH.D., F.A.P.H.A.

Chief, Division of Vital Statistics, Bureau of the Census, Washington, D. C.

EACH of us builds a city during his life. The design of the city is more or less like ancient Rome. A defense wall of stone surrounds it, with drawbridges and towers. A moat filled with water outside the wall affords additional security. Within the wall are forts, homes, schools, churches, and usually a half-finished marble palace; while beneath the surface of the ground are innumerable rooms, passageways, and gloomy dungeons.

This city is the mind! The city that we build is the capital of our world. Together, body and mind make up this world. Together they are a unit in the scheme of things. They are born together; they grow and change together; they age and die together. The health and happiness of the body depends upon the orderliness and unity of the mind. Likewise, the contentment and peace of the mind depends in large measure upon the soundness of the body.

Preservation of the health of body is the acknowledged function of public health. Since health of body is linked inseparably to health of mind, the care of mind also must become the special charge of public health.

What is it like—this city of the mind, of which public health is to be the caretaker?

The ground for the city is staked off at birth. The individual has no choice in the selection of the site. It may be on a rocky mountainside, a fertile plain, or the shifting sands beside the sea. To this ground, which is the brain, come materials with which to build. Sensations of every type—cold, hunger, light, sound, and pain. Experiences from the satisfaction of these sensations—the warmth of the blanket when cold, the comfort from hunger appeased, the escape by flight when danger threatens. From such sensations and experiences ideas are moulded. These ideas are the stones with which the city is built.

At first little thought is given to defense. A home is built, a place to play, and a school. Ideas take broader patterns and become beliefs. A design appears in the buildings erected. As building proceeds, complications arise. Some of the stones do not fit. Conflicts appear. The design of the city must be altered to effect adjustment. Perhaps a new building is started with a connecting passageway. Or a hidden room is created beneath the surface of the ground. The building plan of early life becomes a motley pattern.

In early childhood we start to build the defense wall about our city. Mother must not know about the stolen pie, about the forbidden plunge in the old swimming hole, about the first fumbling curiosity concerning sex. The walls rise higher about the city. The child becomes an adult. The defenses are reinforced. Work on the palace has begun

—the beautiful structure which we want the world to see. Success! But below the surface of the ground the passages and the hidden rooms become a labyrinth.

We wander through this city which we build from day to day. In the palace, the church, the school, and the hidden rooms. We can be only one place at a time. We like to stay in the palace and build additions to enhance its beauty. When progress on this structure is blocked, as so many times it is, we may prefer to return to the playgrounds, the school, or the church. Or perhaps to add to the height of the wall about the city. Or to wander through the hidden rooms beneath the ground.

At times it is necessary to be one place in the city when the desire is to be in another. Impulse, duty, society, job, and love pull in different directions. A dangerous situation this—giving rise to worries, distractions, and nervous tensions. If no answer can be found, the tendency is to escape to underground passageways and close out the noise of conflict. From these retreats, some people never find their way out. Lost in the labyrinth of hidden thoughts, peopled by their imaginings.

We are lonely in the city of our minds. We like to show friends through the courtyard and the outer buildings. Sometimes we take them through the palace and the church. However, the defenses are guarded jealously. Only a chosen few are permitted to enter the hidden rooms beneath the surface. Even they are not shown the dungeon cells.

Yet this need for comradeship, for understanding, and for human contact is vital to all of us. Only through satisfaction of this need is that happiness and fullness of living achieved which all dream of but few reach.

Human society is made of a universe of individual worlds such as those of each of us. The everchanging relationships of these human worlds one to the other is the problem of society. Since mental health depends largely upon our relationships to each other, the social order and its impact on the individual becomes a matter of vital concern to public health.

The world of no one individual can exist for long without social organization. The more modern our times become, the closer knit and the more dependent are the individual worlds each upon the other. Each large group in which we find ourselves brings with it new privileges, new security, new advantages. It also brings new complications and new distractions. Steadily the problem of human relationships becomes more complex and more difficult to solve. An increasing number of us raise the walls of our cities higher for protection. And as we do so we find ourselves more lonely within the cities of our minds, more given to wandering through the dungeon cells.

The toll of mental wreckage is appalling. Last year in a country of 130 millions of people, there were 500,000 in mental institutions. According to a recent extensive survey by the Social Security Board, the totally disabled mental cases, including mentally diseased, idiots and imbeciles, the feebleminded, and the alcoholic and drug addicts number 2,000,000. The family members associated with these cases are 4,800,000. This means that about 5 per cent of our total population is concerned deeply and personally with this problem.

Even this gloomy picture is but a part of the story. It does not include the neuroses. A large proportion of the illnesses which are seen by the practising physician are entirely or in part neuroses. It takes many guises and is called by many names, such as nervous exhaustion, debility, insomnia, gastritis, overwork, and neurasthenia. It has been responsible for much abdominal surgery, diagnosed as chronic cholecystitis, appendicitis, or duodenal ulcer. It

plagues others besides the doctor. It is responsible for many of the personnel difficulties in administration, for many of the problem children in the schools, and for much of delinquency and crime.

Neurosis exists in all degrees of intensity. All of us are subject at some time to its forerunners—distractions, worries, and unsolved problems. These forerunners merge imperceptibly into the various forms of neuroses, and these in turn into the insanities. At times it is almost impossible to draw the boundary lines between one condition and the other.

The physician, who is wedded to the dictums of organic medicine, tends to minimize the effects and importance of neurosis. He is inclined to pat his patient on the back and say, "There is nothing wrong with you. You are fit as a fiddle. Go home and stop worrying." So the patient who knows something must be wrong leaves the doctor's office bewildered. Unsatisfied, he seeks the cultist or the haven of religion, or the solace of alcohol.

The effects of neurosis should not be minimized by the physician nor by the health worker. In extreme cases, neurosis can result in blindness, paralysis, suicide, and total incapacity. Parney found that, in the 35,000 Canadian workers under his care, the psychoneurosis patient lost an average of 32 days a year. This average was exceeded only in cases of tuberculosis, cancer, organic nervous system and cardiac diseases.

While it is true that some mental diseases and many of the mental deficiencies are due to poor heritage, the principal reason for increase in the occurrence of neuroses to epidemic proportions lies in the maladjustment of the individual to this busy modern life of ours. The problems of human relationship must be solved if we are to conquer the health problem.

Let us review the usual basis for psychoneurosis. It is physiological. It has been produced time and again in the laboratory on a variety of animals. For instance, one of the early experiments consisted of conditioning a dog to receive food when he saw a circle of light. His saliva would drip, and peristalsis start up at sight of the circle. The same dog was then conditioned not to expect food when he saw an oval of light. Under such conditions a neurosis was produced when the oval and circle approached each other so that the unfortunate creature could not distinguish whether he was going to be fed or not.

This example illustrates the essential elements which go into the development of a conflict neurosis, i.e., conflict of beliefs held simultaneously, nonrecognition by the individual that the beliefs are in conflict, indecision, and the necessity to act without being able to decide what to do.

Into the city of the mind beliefs once introduced are frequently accepted *as true* even though they are actually in disagreement with each other. After acceptance of facts as truth, it is a natural thing for the individual to resist their reëxamination. It is not comfortable .to readjust quickly one's scheme of understanding. To change a single belief might involve the readjustment of a score of other beliefs. A conflict of ideas forces such readjustment if that conflict is appreciated. After all, it is impossible for even the mentally sluggish to *believe* in two *contradictory things* at the same time—not if it is clearly seen that the two ideas are in *conflict*. Either one or the other or both of the conflicting beliefs must be discarded in order to retain consistency of thought. You can believe that the world is flat if you wish, or that it is round. But it is unthinkable for it to appear to you simultaneously as both flat and round.

If the conflict in beliefs is not faced, the whole scheme of understanding of

the individual is upset. This leads to worries, distress, and pains. If neither of the contradictory beliefs can be discarded, the ensuing internal conflict tears at the fabric of the mind until, after a period of indecision, a neurosis is born. This is nature's way of solving an unfaced problem.

The prevention of neurosis and frequently its cure depends upon a readjustment of the mind, based in one way or the other upon a recognition of inconsistencies. The problem involved is to remove the state of indecision so that the mind can become unified once more by facing reality.

The problem of neurosis is identified with the necessity for internal freedom in thought. The individual must be unified in his mind and consistent in his scheme of understanding if he is to achieve success to the maximum of his abilities. Freedom of thought and the attendant conflict of ideas permits the mind to pass from one state of unity to another state of unity in a normal healthy way. The problems of everyday living and the job can be solved and at the same time unity of thought can be maintained and strengthened.

This problem, I believe, represents the most fundamental challenge facing our present generation. Failure to observe the necessity for true freedom of thought is behind much of the neuroses of mankind. It is also behind many of the problems of administration which plague us daily, and the difficulties of human adjustment which all of us face. It underlies the evils of propaganda with their insidious control of the mind.

When one's scheme of understanding is consistent, the mind is unified and whole. Worries and neuroses cannot take root. Problems of an external nature are faced and usually solved. Reason is substituted for blind belief. Mental hygiene is unnecessary. The mind is well.

Between two healthy and open minds, misunderstandings do not grow into hate. Quite the contrary. The mutual solution of a difficult problem ties such minds together with bonds of mutual respect.

Why do we recoil from facing our internal mental problems, making essential adjustments and thus achieving that unity of thought so essential to physical and mental health? It is because they clash so frequently with deep-held beliefs; because they challenge the foundations on which our mind has built its edifice; because they disturb the smug beliefs with which we are so comfortably satisfied.

To develop a citizenry willing to follow the dictates of its inherent curiosity and permit true freedom of thought based on the willingness to consider the questions raised by others is an educational problem of magnitude. The problem starts in the home with the training of the child. It is concerned with the methods of teaching in the grades, high schools, and universities. The adult who is past the period of academic education can probably best be stimulated to a willingness to question by participation on controversial issues either in group conferences, round-table discussion, or open forum debate.

If we are extroverts by nature, we might be able to force such conflicting thoughts into separate compartments of our mind, lock them in securely, and then, forgetting the prisoners in the dungeon cells, live placidly in the luxury of a forced peace.

Or if we are of those who can confess their sins and feel salvation's peace descend upon us, we might be able to pass the problem to the sturdy shoulders of another—or to the listening ear of a benevolent God, and thus avoid the conflict.

If neither of these two pathways of escape is open, we must face our problem honestly and squarely with an unbiased mind. Adjustment! No other

way is open. That is, except neurosis, which is nature's solution.

It is high time that those of us charged with the advancement of public health should face the challenge of this greatest of all public health problems—the prevention of neurosis and mental breakdown resulting from maladjusted human relationships. The solution of the problem is rooted in the necessity of freedom for our inner thoughts so that the city of the mind can be unified and orderly. It will lead us into new fields of human activity. It is closely linked to the preservation of the social structure and the culture which have been our heritage in this country. If public health accepts this challenge it must tread new pathways of endeavor and thrust more deeply into the fields of social, political, and economic welfare of the people.

To Make America Strong

"We have a job to do. You, and I, and everyone. Our job is this: To make America strong.

"We have our lands to hold, our waters to protect, our skies to guard. We have these, but we have more. We have people.

"We are rich in people. People who love and cherish our lands. People who know how and want to work. People who have deep faith that here we have the greatest chance for life, and liberty, and the pursuit of happiness. People who know the fight for these is never won until it is won for everybody.

"Defense is planes and guns. It is equipping an army to man our military weapons. It is this, and more. It is building the health, the physical fitness, the social well-being of all our people, and doing it the democratic way. Hungry people, undernourished people, ill people, do not make for strong defense.

"This, then, is our job, not all of it, but a vital part: Let us make every American strong, stronger than ever before, sturdier in body, steadier in nerves, surer in living."—HARRIET ELLIOTT, Consumer Commissioner, National Defense Advisory Commission. *Consumers Guide* 6, 20 (Sept.), 1940.

The Community Health Education Program

The Hartford Plan

LUCY S. MORGAN, PH.D., F.A.P.H.A., AND
BENJAMIN G. HORNING, M.D., F.A.P.H.A.

General Secretary, Hartford Tuberculosis and Public Health Society; and Recent Health Officer, Hartford, Conn.

THE various philosophies of health education have been discussed by leaders in this field from the Atlantic to the Pacific Coast, and from the Mexican to the Canadian Border. Health education experts have discoursed at length on the value of the coördinated Community Health Education Program. In spite of this discussion, with one or two exceptions, there are no coördinated community health education programs in the United States at the present time. A review of the literature reveals little in the way of practical experience to guide in the planning of such a program. During the past two years Hartford has been doing pioneer work in this field. The purpose of this paper is to show how the Hartford Plan was developed with the hope that our experience may be useful to health education leaders in planning similar programs in other communities.

There are many potential resources for health education in the average community. The maximum results can be obtained only when all such resources are coördinated into a community program. In Hartford a study of health education activities revealed that although several agencies were doing excellent work, the average agency program was poorly planned and was not making use of modern methods and technics. There was very little community planning, and no effort has been made to evaluate the program. The adult health education activities were found to be especially weak. Past efforts had been misdirected, and those groups with the highest incidence of preventable diseases and premature deaths had not been reached. Printed material had been distributed to persons who could not read English, radio talks had been broadcast to families without radios, and press articles had been directed to persons without access to newspapers.

The study clearly revealed the need for a coördinated community health education program and the General Secretary of the Hartford Tuberculosis and Public Health Society and the local Health Officer took the initiative in organizing such a program. The initiative could have been taken by representatives of any one of the agencies interested in this field. It was stressed from the beginning that the program was to be known as a Community Program, and was to be built around individual and community needs. Participating

agencies were asked to pool their resources in an attempt to interpret knowledge concerning health to every person in the community at his level of intelligence and interest.

SHORT-RANGE PLANNING

In June, 1938, representatives of official and nonofficial agencies interested in health were invited to meet and discuss plans for developing a coördinated community health education program in Hartford. A suggested outline combining both short-range and long-range planning was presented by the writers. An executive committee of 18 persons was appointed. They represented the following agencies:

Board of Health
Board of Education
Connecticut Dairy and Food Council
Department of Public Welfare
Hartford Tuberculosis and Public Health Society
Visiting Nurse Association
Union Settlement of Hartford
Mitchell Neighborhood House
Women's League
Diocesan Bureau of Social Service
Young Women's Christian Association
Boy Scouts
Parent-Teacher Association
League of Women Voters
Hartford Community Chest
Council of Social Agencies
Hartford Seminary Foundation

The committee decided upon the following short-range objectives:

1. To organize and to utilize existing groups for health education among that portion of the population having the highest incidence of premature deaths and preventable diseases.
2. To recruit volunteer leaders with professional training and suitable personal qualifications, and to train such leaders in modern methods of presenting health material to groups of various educational backgrounds and intellectual levels.
3. To provide such audio-visual health education equipment and material as motion picture projectors, delineascopes, films, filmstrips, exhibits, charts, electrical transcriptions, models, maps, slides, and printed material.

During the summer 30 subjects were selected for discussion among adult groups. They included such popular topics as:

Protect Your Home from Tuberculosis
Our Children
Good Food at Low Cost
Take Care of Your Heart
New Ways for Old
A Safe Place to Live
Teamwork for Health
A Good Investment
The Story that Death Rates Tell
Microbes and Health

The subjects were grouped into three series of 10 lessons each, and one topic was scheduled for each meeting during 30 weeks. Classes were begun in October and were continued through May. To make the program as flexible as possible, each group was offered the whole or any part of the entire series.

Each group selected its own leader who, with the assistance of professionally trained speakers, conducted the classes. Participating speakers included doctors, dentists, nurses, teachers, nutritionists, mental hygienists, and social workers. They represented the Board of Health, Dental Society, Medical Society, Hartford Tuberculosis and Public Health Society, Visiting Nurse Association, Board of Education, Young Men's Christian Association, Young Women's Christian Association, Boy Scouts, Department of Public Health–Yale Medical School, State Department of Health, Connecticut Dairy and Food Council, and other health and welfare agencies.

Summaries of the subjects to be discussed were prepared by the speakers and sent to the leaders before the meeting. The Hartford Public Library provided a bibliography for each subject, copies of which were sent to each leader. Most of the groups met weekly and enrolled for the entire series. Gaily decorated notices and posters announced the meetings.

During this first experimental year an effort was made to reach as many different types of groups as possible

and to determine their health problems, in order that future programs could be built upon their actual needs and abilities. Groups participating included neighborhood houses, churches, schools, the Young Men's Christian Association, the Young Women's Christian Association, the Parent-Teacher Association, clubs—industrial and business—and the Board of Education Citizenship Classes. The neighborhood and Board of Education groups were attended largely by French-Canadians, Poles, Italians, and Negroes. There was wide variation in educational background, and it was necessary to use an interpreter with some of the classes.

The Executive Committee had expected that the health discussions would be only one of the activities of the groups. After a short time, however, the leaders found that many groups were depending entirely upon the health discussions and had planned no other program. Not wishing to overemphasize health, the leaders frequently supplemented the program with music, plays, and games. Wherever national programs were established, an effort was made to "tie in" with them in order to give greater impetus to both programs. Among such examples were the Early Tuberculosis Diagnosis Campaign, Negro Health Week, Social Hygiene Day, and Child Health Day.

The Board of Health and the Hartford Tuberculosis and Public Health Society were responsible for supplying most of the audio-visual equipment and materials. These two agencies made a survey of visual educational material available from state and local sources. Mechanical media such as films, filmstrips, electrical transcriptions, exhibits, and printed matter were reviewed, and such materials as were suitable for use in the community were purchased or borrowed. The Connecticut State Department of Health, The Connecticut Dairy and Food Council, and the Metropolitan Life Insurance Company were valuable sources of teaching material. The Hartford Tuberculosis and Public Health Society and the Board of Health purchased equipment including sound motion picture apparatus, filmstrip projectors, and delineascopes.

To assist agency leaders to produce visual education material with local significance the Board of Health is sponsoring a Works Progress Administration Project which is a unit of a state-wide project. The staff changes from time to time, but usually consists of a supervisor, two artists, two carpenters, a motion picture operator, a library research worker, and two clerks. This group, with the coöperation of local leaders, is producing, helping to display, and keeping records of valuable exhibit material illustrating many phases of the Community Health Education Program. This part of the program will be discussed in detail in a forthcoming paper.

When tuberculosis was discussed, the films most often shown were "Let My People Live," "On the Firing Line," and "Behind the Shadows." With the films the speaker used isotype charts and colored isotype slides and other illustrative material on tuberculosis. Films and exhibits on tuberculosis were shown in the high schools of the city to stimulate interest in the tuberculin-testing program sponsored annually by the Board of Education and the Hartford Tuberculosis and Public Health Society.

A number of nutritionists and home economics teachers volunteered their services as specialists and led discussion groups on nutritional subjects. One excellent example of community coöperation was furnished by an animal feeding demonstration. Seven pairs of 21 day old rats were secured by the Dairy and Food Council from the Connecticut Agricultural Experiment Station. The Council nutritionists transferred the

animals to the Home Economics Department of St. Joseph's College in West Hartford, where the students decided upon various demonstration diets, and cared for the animals during this period. The next step was to transfer the rats to the office of the Dairy and Food Council. From this base the rats were exhibited at nutrition meetings held at settlement houses, churches, clubs, high school adult evening classes, and other organized groups in different parts of the city. The demonstration animals created much interest and two of the cages placed strategically near the gymnasium of the local Young Women's Christian Association motivated a request for a series of nutrition lectures.

Mechanical media found useful to supplement the talks on syphilis were the talking filmstrip, " For All Our Sakes," and the films, " Let's Open Our Eyes," and " Science and Modern Medicine." A three-panel exhibit on syphilis, prepared by the Hartford Board of Health with the assistance of the WPA created widespread interest in this subject. It was considered significant that groups, who had at first refused or hesitated to have talks on venereal diseases, requested discussions of this subject during the last part of the course. Members of the groups commented on the fact that whole neighborhoods were now informed on a subject which a year ago had been considered unsuitable for discussion.

The Health Division of the Council of Social Agencies approved and sponsored the program. Monthly meetings of the Health Division served as educational clinics in which local health problems were discussed and the effectiveness of materials and technics for group instruction were tried out.

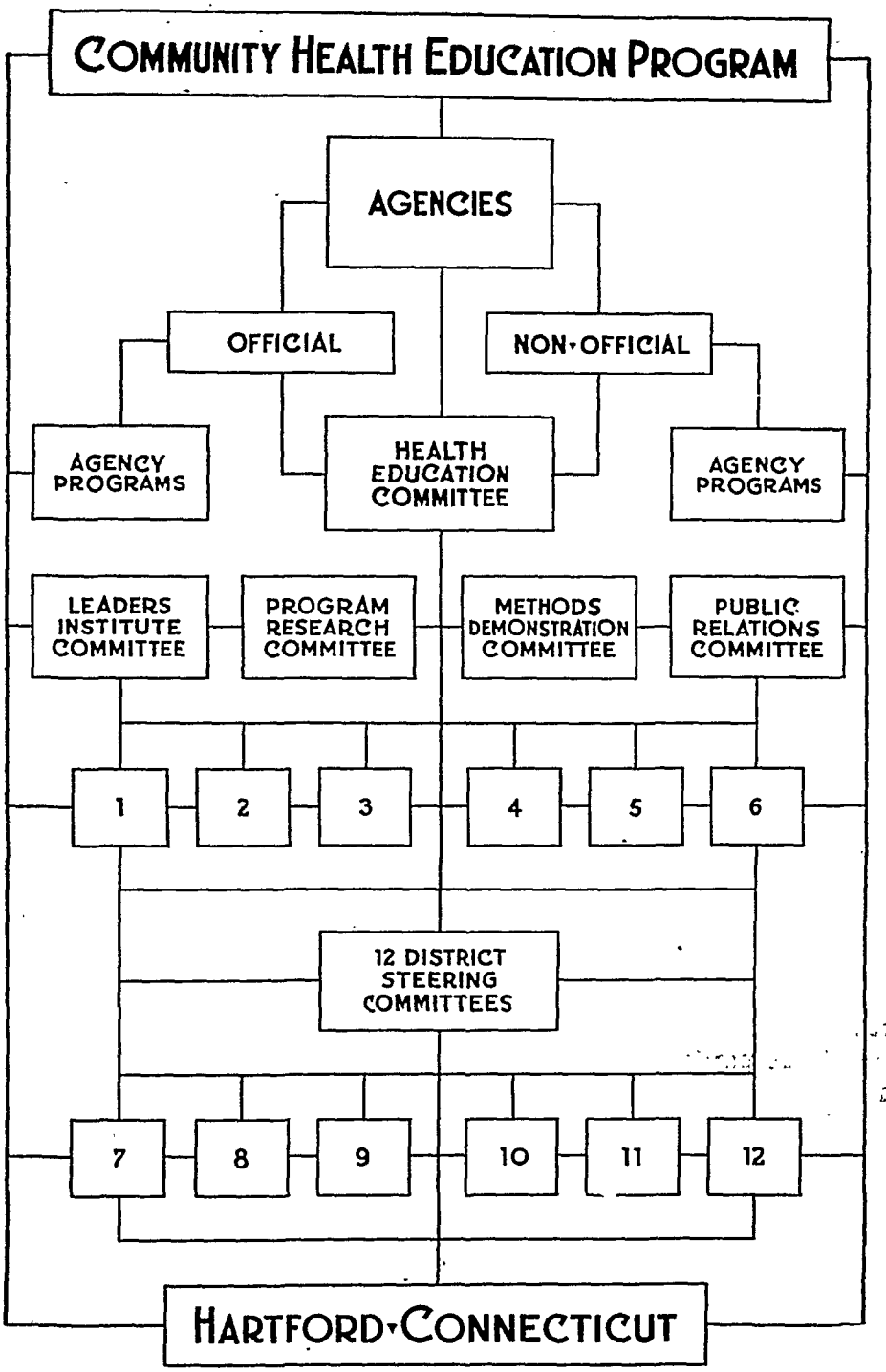
The local press and radio stations were generous in giving space and time to the program. Press articles and radio talks were prepared with the assistance of the WPA reporter assigned to the Visual Education Project. The publicity program included a plan for the development of a radio workshop with the idea that " dummy " broadcasts, as well as real broadcasts were useful tools in education. This part of the program was developed later under the guidance of the Community Chest.

The Department of Public Health of Yale Medical School delegated a graduate student to study and evaluate the project. During the 30 week period in which the program was evaluated, 327 meetings were held, with 18,397 in attendance. A total of 121 groups participated in the program, with an average attendance of 56. Seventy-three speakers gave 310 talks on 47 subjects, and 46 films were shown 329 times. There were 14 demonstrations with exhibits given, 3 field trips made, and 35 charts shown during the 30 week period.

LONG-RANGE PLANNING

It is generally agreed by most health educators that before plans for a long-range program can be completed, certain short-range achievements must be attained. This is necessary as a fact finding procedure, and to bring encouragement to participating groups. The 1938–1939 program served this purpose. It was a valuable experience and most of the short-range objectives were achieved. The 18,000 people reached, the 121 groups served, and the 73 speakers who gave their services to the program were all tangible evidence that the community was ready to build a coördinated health program.

The Health Education Committee next planned a five year program. The project is outlined in the accompanying organization chart. The resources of the entire community with help from certain national and state agencies were mobilized for action. The program supplements individual agency programs and serves to bring together the effort of all agencies and persons working in the



field of health education into a coördinated community health education program. The work has been decentralized into education districts with the following emphases: (1) Institute for Leaders, (2) Methods Demonstration in Schools, (3) Research, and (4) Public Relations.

THE DISTRICTS

The city has been divided into 12 health education districts by a grouping of census tracts. The population characteristics are known, and morbidity and mortality rates have been determined. Many problems are found common to

all districts. On the other hand, certain problems which are under control in one part of the city may be acute in another. For example, the tuberculosis death rate is 10 times as high and the syphilis death rate is 20 times as high in certain districts as in others. The infant mortality rate in some districts is double that for the city as a whole. During the year 1939–1940, a special effort has been made to develop the program in 5 districts where the need is greatest. Each district has a steering committee which studies the problems and plans the program. The committees consist of such representative persons as (1) Parent-Teacher Association members, (2) home economics teacher, (3) science teacher, (4) clergyman, (5) school principal, (6) group leader, (7) community house leader, (8) visiting nurse, (9) social worker, and (10) others. Graduate and undergraduate students in public health, home economics, and social work from nearby universities and colleges are working with the steering committees as health education consultants.

The program in each district is centered in an agency where it will reach the greatest number of persons or where, because of the particular type of work which the agency performs, it becomes the logical pivot for the program. Thus in Districts I and II the pivot is a community house, in District III a Negro Health Guild, in District IV two "over all agencies," the Young Women's Christian Association and the Young Men's Christian Association, and in District V a public school.

INSTITUTES FOR LEADERS

The training of leaders is of fundamental importance to the success of the program. For this purpose institutes are held at regular intervals. They serve as educational clinics where the Health Officer presents community health problems and educators discuss the various methods and technics to be used in reaching persons of all ages and of different racial and educational backgrounds.

The institutes for leaders are also used as a means of keeping the community informed concerning available audio-visual material. For example, if the subject under discussion should be nutrition, films concerning the subject are shown. Exhibit material, pamphlets, and other visual aids are on display. Institutes concerning the following subjects were held during 1939–1940: (1) The Community Health Program, (2) Veneral Diseases, (3) Tuberculosis Control, (4) Nutrition, (5) Maternal and Child Hygiene, (6) Housing, (7) Environmental Sanitation, and (8) Hay Fever and Ragweed Eradication.

METHODS DEMONSTRATIONS IN SCHOOLS

Emphasis II of the long-range Community Health Education Program provides for methods demonstrations in schools. Ideally, the adult program should be coördinated with the formal program of the schools in order that adults and children may be learning and discussing the same subjects at the same time. Through special classroom demonstrations the first step toward this end is being taken in Hartford. Teaching units have been prepared for use in schools concerning tuberculosis control, syphilis control, nutrition, and other public health problems. The personal educational medium in the classroom is supplemented by such mechanical media as motion picture films, filmstrips, electrical transcriptions, exhibit material, and printed matter.

RESEARCH

In order to evaluate a community health education program, it is necessary from time to time to clarify the objectives and to determine the extent to which they have been attained. In the Hartford program Emphasis III is

concerned with research. A committee composed of local leaders in the field of education and health functions actively. This part of the long-range program provides for the development of technics for the evaluation of methods, for attitude testing by scientific sampling, for fact finding surveys, for the determination of morbidity and mortality rates by population groups, and, finally, by replanning the program in the light of significant findings. The work of the research committee will be of increasing importance as time goes on, and eventually it will assist with the final evaluation of the five year program.

PUBLIC RELATIONS

A certain percentage of the population will never be reached through district programs, leaders' institutes, methods demonstrations in schools, or individual agency programs. For this portion of the population the Hartford Community Health Education Program has made other provision. Open forums are held with authorities in the field of public health as speakers, weekly broadcasts are given, and exhibits are displayed in public places. All phases of the program are reported by the local press, and feature articles are prepared at regular intervals. The public relations emphasis is correlated with the other emphases of the program.

DISCUSSION

In this brief discussion of the Hartford Community Health Education Program an attempt has been made to describe some of the early steps in planning, to point out a few of the short-range achievements, and to map out future plans. The long-range program will be discussed in detail in a series of forthcoming papers.

Many early steps of the program necessarily have had to be executed on a small scale, and glaring weaknesses have appeared from time to time. In any program which attempts to coördinate activities of community groups, there is always the problem of too few leaders, overambitious programs, and individuals with a non-coöperative and professionally-centered attitude, whose narrow conception of their own work limits their usefulness in community effort.

Community health programs can be planned and carried out if certain key persons are willing to assume the responsibility for coördinating the efforts of the various organizations, and if no one agency is allowed to dominate the program. Only through coördination of effort of all organizations can proper impetus be given to individual programs, and only through group attack upon common problems can long-range programs be made effective.

A comparison of certain community health educational activities for the year 1938–1939 is made in Table 1. These data will give some idea of the stimulus the program has had upon health education activities in Hartford.

TABLE 1

Comparison of Certain Health Educational Activities

	Years		Per cent
Activity	*1938*	*1939*	*Increase*
Talks	254	418	65
Broadcasts	47	120	155
Film Showings	176	488	177
Press Column Inches	6,299	10,398	65
Pamphlets Distributed	165,669	208,071	26
Charts Used	53	875	1,550
Exhibits	14	68	386

SUMMARY

The Hartford Community Health Education Program is past the early experimental stage. Its value to the community has been demonstrated in many ways. For example, it has (1) trained leaders, (2) supplied visual educational equipment and materials, (3) provided motion picture operator service, (4) maintained a speakers' bureau, (5) advised local agencies concerning their programs, and, most im-

portant of all, (6) has coördinated the efforts of all individuals and agencies working in this field into a city-wide program.

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Population Trends and Public Health Problems*

FREDERICK OSBORN

New York, N. Y.

YOU who are engaged in the great work of public health are naturally interested in population trends. You have been making them. The average expectation of life for the white population of the United States in 1935 was 62.7 years, 19.2 years longer than the expectation of life in 1890 for the population of Massachusetts of 43.5 years, which was then fairly representative of the nation as a whole. In a period of 55 years, advances in medicine and public health have added almost 50 per cent to the average expectation of life. These practical results which have been achieved in a relatively brief period represent the most remarkable change for the better that has ever taken place in human affairs.

The fall in the death rate has been pretty even throughout the entire population, and deaths prior to the end of the reproductive period are in general now so infrequent that death is a relatively small factor in causing differences in reproductive rates. Deaths occurring prior to the end of the reproductive period among the white women of this country in 1930 reduced net reproduction in Oregon by 10 per cent, in New Mexico by 30 per cent. These moderate differences caused by deaths are to be compared with the gross reproduction of Oregon at 0.91, nine points below replacement, and the gross reproduction of New Mexico of 217, double that of Oregon, due entirely to differences in births. Differences in death rates between occupational groups are also small.

The reduction in deaths has been, rather unexpectedly, accompanied by a very rapid reduction in births. Only a short time ago Malthus predicted that births would increase the population to the point where the natural checks of disease and famine prevented any further increase in population. Yet, in the period when medicine has achieved its greatest conquests over the natural checks, births have shown their greatest decline. Apparently the rise in standards of health and education has been accompanied by a new sense of responsibility on the part of parents for maintaining these high standards for their children. There has been a heavy decline in the proportion of large families. One hundred years ago on this continent the population was almost doubling from one generation to another as a result of natural increase alone, notwithstanding the high death rates of that period. Today, the women of childbearing age are not having quite enough children to replace the present population in the next generation. The fall in births has been no less spectacular than the fall in deaths.

* Read at the Annual Conference of Health Officers and Public Health Nurses, Saratoga Springs, N. Y., June 24, 1940.

In contrast to the even nature of the reduction in deaths, differences in birth rates are very large, whether between different regions or between different occupational groups. In 1930 birth rates of the farm population of the United States as a whole were about double the birth rate in cities of 100,000 or more. In terms of actual reproduction, after taking into account the slight differences in mortality, the rural farm population was increasing at the rate of 60 per cent per generation, whereas the population of cities of over 100,000 was declining by 25 per cent per generation, except in so far as reproductive losses were offset by immigration. Birth differentials between occupational groups in the cities are not so large, but ranged in 1928 from 0.76 for professional groups to 1.17 for manual laborers. Unfortunately, no information has yet been obtained on differences in births in families of different types within each occupational group.

These trends in population are creating new problems in public health, which will become increasingly pressing as public opinion demands that something be done about them.

The first expression of public opinion as it relates to population trends is the endorsement of family limitation. Birth control is being accepted by a constantly increasing number of persons. Controversies are now more as to methods than as to the principles involved. Those churches which have opposed the methods usually advocated by the medical profession, have approved other methods based on a new understanding of the time at which conception can take place. A public opinion is rapidly forming which feels that there should be no married couples who through ignorance or poverty are forced to have children that they do not want to have. This public opinion made itself felt for the first time in government when the State of North Carolina added birth control clinics to its other public health services, and was followed shortly in this course by the State of South Carolina. The new service has the support of the great majority of people in both states. The public was as ready to accept birth control as it was ready to repeal prohibition at the end of Mr. Hoover's administration.

Public opinion is increasingly demanding that not only couples who are informed and competent but also those who are ignorant and isolated should be in a position to practise birth control if they want to. This growing attitude on the part of the public indicates the likelihood of a new and heavy responsibility for those who are actually administering the public health services of this country. In some states it has already been undertaken. In other cases, a few of those in the public service have been taking on this new work quietly and on their own responsibility in recognition of the needs developed by private agencies. Evidently those in the public service cannot go beyond public opinion. Perhaps in this instance they cannot even follow majority opinion, but must wait until even a minority ceases to be in opposition. That time seems to be approaching. A dictatorship may keep the mass of the people in ignorance and isolation and require that the breeding of the next generation be the unwilling task of those couples least able and least anxious to give their children a sound environment; but in a democracy parents must be free to choose whether they will have large families or small. The idea of compulsory parenthood is not an acceptable idea to Americans. So long, therefore, as we keep the American pattern of living, it is likely that there will be an increasing pressure on public health authorities to help individual parents carry out their desires as to size of family. This is not entirely a new responsibility for either the doctor or the nurse. Whether or not to have

another child must be a question which has been asked by individual parents innumerable times in the past two decades. Even though the doctor or the nurse may not give a direct answer, the indication must be there in their attitude and point of view. And the other question, where shall we go for advice on contraception and how much will it cost, while asked less frequently, may be even more often in the parents' minds. The doctor and the nurse, through their intimate contacts with the district in which they live, are perhaps in a better position than anybody else to judge from the competence and responsibility of the parents what advice they should give to any particular couple. Some parents present a whole new set of social and health problems with every new child. When such parents desire to limit the number of their children, doctor and nurse will have little hesitancy in desiring to help them find the means.

On this negative side of public health, the limitation of undesired births, there is one other aspect which must be touched on, namely, the problem of reducing the incidence of serious hereditary defect. The public health movement has done much to develop a social consciousness which demands better care and usually institutionalized care of defectives. Without any increase perhaps in the actual incidence of defect, every state in the union has increased its expenses for the state care of defectives until now the cost stands at a substantial proportion of the state budget in the more advanced states. The average taxpayer is becoming aware of what the proper support of the defective means in taxes, as well as what the incidence of defect means in terms of human suffering. Hence there is a growing demand that something be done about it, a demand frequently finding expression in a rather uncritical endorsement of sterilization. The answer of course must be developed on much broader lines. First, a great increase in research in genetic factors related to physical and mental defect; second, a painstaking search to record those family stocks in which serious defects seem most frequently to reappear from one generation to another; and, finally, practical attempts to diminish reproduction of strains known to be carriers of serious defect. On the basis of present knowledge these attempts would be limited to a small fraction of the population. The methods to be employed must be developed by the public health authorities who will undoubtedly be held responsible by the public as the situation becomes better understood. I will not attempt here to forecast these methods except to suggest that they will include in many cases an increase in segregation, in others a prohibition of marriage, in others urgent advice on the use of birth control, and I presume in some cases sterilization.

So far we have considered only the part likely to be played in the near future by public health authorities in helping to diminish the birth of unwanted children, including children likely to carry hereditary defects. Other demands involving new and very different responsibilities are already developing. These new demands will have to do with an increase of births among competent and responsible parents.

At the present time the women of this country are having almost, if not quite, enough children to continue our present level of population. Such a stable condition should not of itself arouse public feeling, but the birth rate is still falling rapidly in areas where births are most frequent at present, and the continued decline in deaths will not help reproduction, since the great majority of all girls born today already live beyond the end of their reproductive years. The net rate of reproduction therefore seems due for a continued rapid fall. It is only

the high birth rate of some of the rural southern states that holds up the present balance of the country as a whole. It looks to the student of population as though another 20 years would bring the net rate of reproduction of the United States to a figure not far from 0.8, 20 per cent below the rate required for replacement. At such a point, and particularly if we are then living in a competitive and nationalistic world, the public is likely to desire an increase in births. The same situation arose in western European countries between 1930 and 1940, and in the case of Sweden, Belgium, Germany, France, and England the question of depopulation became one of the most popular public questions of the day, and in each of these countries except England important steps were taken by the government in an attempt to remedy the imminent loss in numbers.

Other and more important reasons for increasing births may weigh even more heavily and more immediately with the American public. The present rate of reproduction is maintained in the United States, as in all western European countries, only by high rates among isolated and ignorant persons, while on the other hand the rate of reproduction among responsible parents at every occupational level, with the exception of a small number of responsible parents in the prosperous agricultural areas, is already at a level far below replacement. We have hardly any knowledge of the biological effects of a system of birth distribution which favors the isolated farmer, and which appears in the cities to favor a good many of the less competent family strains. Certainly there is no evidence that farm stocks are not as good as city stocks, but the effect of present birth differentials on educational and cultural progress is evident. Much of the effort being made in public education, much of the effort in health education, is being offset by the fact that the educational job has to be attempted all over again in every generation, because the couples who have learned most have the fewest children to whom they can pass on their education, and the couples who have learned least have the most children, whom they bring up in ignorance. All psychologists are agreed that the home influence is second to none, not even to the influence of the school, in developing intelligence. Thus the present distribution of births is a force which retards educational and cultural advance.

The movement to increase births among competent and responsible parents seems the necessary counterpart of the movement to decrease births among irresponsible parents. In so far as those in the public health services have a part in helping parents limit births when they do not want more children, they are likely also to have a part in helping parents have and care for more children when they do want them.

This is the new responsibility which present population trends seem to be rapidly piling on the already burdened back of the public health services. Yet it may not be an unwelcome burden. The encouragement of births among responsible parents, and helping such parents care for their children, has a constructive quality which will appeal to those whose task of trying to teach health measures to parents who do not learn must sometimes seem discouraging.

In the effort to limit births, the tools are birth control information and materials. In the effort to increase births, new tools are needed that can only be supplied by a redirection of many community activities. Most important is the economic background for child care, which is needed to secure to children certain minimum requirements without sacrificing the family's level of living. Economic aids will be most important, and most difficult, in the case of families

with 4 or more children. But it must be borne in mind that the actual replacement of any population group requires that some 30 per cent at least of the married couples have 4 or more children, including a considerable proportion with 5 and 6.

Nutrition is the largest single item in the American budget, as well as the item which most concerns the large family. Lorimer and Roback, in a recent article in the *Milbank Memorial Quarterly*, report on a study of nutritional levels of families with different numbers of children, based on the recent extensive *Study of Consumer Purchases* made by various government agencies. The data are limited to 4 family types, namely, couples with no children, with 1 child, with 2 children, or with 3 or 4 children; and to three areas—Chicago, a group of 3 middle sized cities, and a sample of farm families in Pennsylvania and Ohio. In all families food was the largest item in the budget, ranging from 30.2 per cent of the total budget for couples with no children in the middle cities, to 42.8 per cent for farm couples with 3 or 4 children. In each case, the proportion of the budget allotted to food increased with the number of children, but the increase was never enough to take equal care of the needs of the additional children. Standardized expenditures (or values) per meal per equivalent adult are given in Table 1.

TABLE 1

Standardized Expenditures per Meal per Equivalent Adult

	Couple 0 Children	*Couple 1 Child*	*Couple 2 Children*	*Couple 3–4 Children*
Chicago	$0.246	$0.200	$0.170	$0.144½
Middle cities	0.183	0.148	0.124	0.103
Pennsylvania-Ohio farms	0.138	0.122	0.105	0.092

These figures are from a fair sample of the average American family. Apparently the present widespread undernourishment of children is mostly an undernourishment of the children in large families. At the present level of American incomes, adequate nutrition is beyond the reach of most parents if they have 3 or 4 or more children.

In the *Study of Consumer Purchases,* housing was next to food the largest item in the family budget, ranging from 18.7 per cent of the total budget for farm families with 3 or 4 children to 26.4 per cent of the total for couples in Chicago with no children. The larger the family, the smaller the proportion of income available for housing. Under present conditions, additional children have to be crowded into smaller and poorer housing facilities. Thus housing, like nutrition, presents serious obstacles to responsible parents who might otherwise want to have additional children.

Clothing and transportation, each taking from 7 to 9 per cent of total income, are probably less important obstacles in the minds of parents desiring to plan larger families. Medical care, calling for about 4 per cent of the budget, may be more serious, because the fear of illness and the fear of not being able to secure the best medical care may be strong reasons for limiting the size of family.

Nothing less than community participation in the cost of rearing children can equalize the burdens of parents with many children compared to couples with few or no children. Only when these economic deterrents are removed will the basic conditions be such that competent and responsible parents will feel in a position to contribute their share, or more than their share, to the replacement of the next generation.

Children are now, as they always have been, the country's great potential asset.

But they are no longer an economic asset for the individual parents, as they used to be in the agricultural community of the past, but rather an economic liability to the parents. What we are proposing is not that parenthood should be helped, but that childhood should be helped. The distinction is important. Community aids to the proper nutrition of all children in public schools, housing designed for families with children, would build up no new pressure group of selfish interests, but would come as a result of pressure from all those interested in the welfare of children and in the future welfare of the country. Nor would the type of community aid to children, which will be developed to meet these new needs, necessarily be a matter of great expense. Supplementary nutrition would be in part a transfer of an existing burden from parents to the community as a whole, and in part an added expenditure which would pay for itself in more vigorous healthy citizens. Housing planned for family life and the convenient rearing of children is more a matter of proper planning than of greatly added expense, and should pay for itself by contribution to better health and to the reduction of juvenile delinquency. In the long run, if such changes helped responsible parents to bear and rear a larger proportion of the nation's children, the expenses incurred by the community would be more than offset by lessened expenses in every field of social and health activities.

If an excuse is needed for bringing these matters to the attention of the public health authorities of a great state, it is to be found in this: that these problems are imminent, they are already being dealt with in European countries, and it is important that they be dealt with so far as this country is concerned in a democratic way, without catering to any class or group, and in such a way that not only will a new and better distribution of births be made possible, but that they will also contribute to the improvement of the public health. The doctors and nurses of the public health service are likely to play an important part in carrying out whatever measures are ultimately adopted. If the situation is clear to them in advance, they will be able to contribute from their broad experience to the development of measures which are both sound and effective.

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New Vital Statistics Directory

THE Vital Statistics Section announces completion of the second edition of the Vital Statistics Directory. Any member of the Section is entitled to a free copy of the Directory. The cost to non-members is $.50 per copy.

Essentials of a Workable Merit System*

DON C. SOWERS

Director, Bureau of Business and Government Research, University of Colorado, Boulder, Colo.

THIS paper focuses attention on the problem of the proper organization and extension of the merit system in those areas, state and local, where party dominance and control of public employment is still effective or where the cost of maintaining a technical personnel service would be prohibitive.

In spite of the remarkable progress which has been made in recent years in the extension of the principles of the merit system, only 3 of the 11 western states, namely California, Colorado, and New Mexico, have adopted the merit system for state employees. What form of organization can be set up, to insure a sound merit system for public health employees, state and local, in those states which do not have a state-wide merit system? The problem is further complicated by the fact that the number of employees to be provided for is exceedingly small in these sparsely settled states, and the cost of maintaining a full-time personnel staff would be prohibitive.

A survey of the governmental units which were operating under the merit system in 1937 made by the Civil Service Assembly indicated that there were 863 such units in the United States as follows: the federal government, 14 states, 169 counties, 674 cities, and 5 special districts. Since 1937, 4 additional states have adopted merit systems and one state, Arkansas, has repealed its law so that by 1940 only 17 of the 48 states had state-wide merit systems. Only 169 of the country's 3,000 counties are under some form of merit system provisions, only 8 maintained their own civil service agencies. In 4 states, the personnel functions for counties are performed by states agencies. These states are Maryland, New Jersey, New York, and Ohio. In 5 additional states which have recently adopted merit systems the state agencies are authorized to perform technical personnel services for local governments on a cost basis.

Almost every large city in the United States operates under a civil service system of one type or another. Some cities have their own personnel agency while others operate through a state agency. Four hundred and thirty-nine cities out of a total of 674 cities maintain their own personnel agencies. The jurisdiction of some municipal commissions extends to all municipal employees but in other cities the police and fire departments alone are covered — and sometimes only one of these.

Many counties and small cities find the cost of operating their own personnel agency and providing pensions for superannuated civil servants prohibitive. Other difficulties arise in the matter of recruitment of competent personnel because the small city cannot offer a complete career service. To meet

* Read before the Western Branch American Public Health Association, at the Eleventh Annual Meeting in Denver, Colo., June 27, 1940.

these problems a number of devices have been developed for making available to counties and small cities the technical operating personnel services that are essential in a merit system.

STATE AND LOCAL RELATIONSHIPS IN PERSONNEL MANAGEMENT

In California, cities may contract with the State Personnel Board or with another county or city for the administration of its personnel services. In New Mexico, the state merit system is available to the employees of municipalities.

In nearly a dozen states the state civil service agencies have some jurisdiction over the personnel matter of local governments and may perform technical services for them.

In Michigan, the Municipal League supplies the technical personnel services required by the small cities which may enter into contract with the League to perform these services.

This trend toward centralization in the state administration of the personnel functions of local governments is but one aspect of the many types of state and local relationships. The same tendency toward centralizing administrative control over local functions in state agencies is found in finance and taxation, highways, education and relief and public welfare. In the field of public health administration the influence of the state is steadily expanding. The state controls the collection of vital statistics, supervises water works and sewerage systems, inspects hospitals, controls venereal diseases and extension of rural health units.

In spite of these developments in a dozen states, it is still true generally that the local units of government have complete control over public personnel management. The methods of selection of appointed local officials and employees, their standards of qualification, their compensation, tenure and removal are matters of local concern alone. In the field of public health personnel management there are to be noted some interesting examples which indicate a trend toward greater state administrative control.

In Oklahoma, South Carolina, and Wyoming, for example, the county health officer is appointed by the state health officer. In Georgia, the county health officer is appointed by the local authorities subject to the approval of the State Health Officer (*Public Health Organization*, p. 132). Illinois and Ohio require local health officers to be appointed from lists prepared by the State Board of Health after competitive examinations. State appointment and removal of rural health officers are provided in some states. In Maryland, the deputy state health officers also serve as the county health officers of the local county units of health (*Public Health Administration in Maryland*, p. 19). The Boards of County Commissioners serve as the county board of health, but the appointment of a county health officer by the board can be made only with the advice and consent of the State Board of Health after the candidate has qualified before the State Employment Commissioner.

In Virginia, a recent survey recommends "that the State Board of Health, in coöperation with the State Commissioner of Health, be empowered to establish minimum qualifications for directors, nurses, and technical employees of the state department of health, for superintendents of public tuberculosis sanatoria, and for directors and sanitation officials of county and district health departments, whether such departments receive state aid or not." (*Public Health in the State and Counties of Virginia*, Rockefeller Foundation, p. 75).

FEDERAL, STATE, AND LOCAL RELATIONSHIPS

One of the most significant develop-

ments of the last few years has been the part played by the Social Security Board in formulating and promulgating standards for a merit system of personnel administration in the state employment and state public assistance agencies under its supervision. The board has the responsibility of finding that state public assistance plans and unemployment compensation laws approved by it provide, after January 1, 1940, for necessary methods of administration, including methods relating to the establishment and maintenance of personnel standards on a merit basis.

These standards are applicable to all personnel, both state and local, engaged in the administration of these programs. The board is interested in the development of effective merit systems but exercises no authority over the selection, tenure of office, or compensation of any individual employed in conformity with the provisions of such systems. The board further believes, however, that the continuing application of these standards will give reasonable assurance of a proper basis for personnel administration, will promote a career service, and will result in increased operating efficiency in the state agencies.

If a state has a state-wide civil service system operating under standards substantially equivalent to those provided, such state civil service system should be applicable to the state social security agencies. If a state does not have a state civil service system, provision must be made for the establishment of a merit system administered by a merit system council.

The minimum standards prescribed for state agencies conform to the best principles and technics which have been evolved in personnel administration.

This plan of the Social Security Board should result in placing personnel administration in the agencies under its control on a sound and proper basis, and suggests a method which might be followed by other federal departments which have close relationship with state and local governments. The plan might be adopted by the Bureau of Public Roads in its relation with the state and local highway department, by the Department of Agriculture in its numerous contacts with state and local units, by the U. S. Public Health Service in its relations with state and local health departments, and the Office of Education in its contacts in the educational field. In fact, when grants-in-aid are made to state and local governments, federal approval of the personnel administration might be required as one of the conditions on which the grant is made.

In the states which have a competent and adequate state-wide civil service system in operation, it should be possible to entrust the responsibility for public health personnel management to this agency. In those states in which the state system is inadequate, as in Colorado, where the state civil service commission does not employ a staff trained and experienced in personnel work, some further adjustments will have to be made in order to secure a sound and workable merit system.

One possibility would be for the state department of health to furnish the technical assistance necessary to prepare position classification plans and the compensation plan for all employees, state and local, employed in public health work, and then secure the adoption and promulgation of these plans by the state civil service commission. Some of the technical work has already been done by the Committee on Professional Education of the American Public Health Association, which has prepared a statement of educational qualifications for health officers, health engineers, sanitarians, and other groups of public health employees. Further assistance should be given the state civil service commission by the state department of

health through the appointment of special examiners and examining committees to aid in the conduct of examinations and the administration of tests for the various professional, scientific, and technical positions required in the operation of the modern health department.

A second possibility would be for the state department of health to enter into a coöperative relationship with the federal and state public welfare agencies, for the purpose of employing jointly a trained director of personnel who could assume responsibility for all the personnel functions required in the operation of a sound merit system for all public health and public welfare employees. The major difficulty which will arise in connection with this plan is to effect a satisfactory working relationship with the existing civil service commission. In Colorado, where the civil service commission is a constitutional body and possesses complete control over all civil service matters, should the Director of Personnel be directly responsible to the civil service commission or to the operating departments of health and public welfare? No doubt considerable experimentation will be required before a satisfactory plan can be evolved, and much will depend upon the degree of coöperation which it will be possible to secure from the state civil service commission.

In those states which do not have a state civil service system, it will be necessary to establish one for the purpose of providing a workable personnel system covering all public health employees. Since the federal Social Security Board has already provided for a merit system organization to serve all the state public welfare agencies engaged in the administration of its programs, it would appear logical for the state health department of each state to enter into coöperative relationship with these social security agencies and jointly establish a personnel system. In many ways this plan may prove to be easier to work out than where an unsatisfactory merit system is already in operation.

The essential features of such a merit system would be a civil service commission or merit system council composed of three or five members appointed by the administrative agencies concerned, or by the governor on recommendation of the agencies with advisory and investigational powers and with the power to makes rules and regulations and to appoint a trained director of personnel selected on an impartial merit basis who would be responsible for all the administrative and technical work of the agencies.

An essential requirement for this agency must be adequate financial support. One per cent of the personnel service pay roll of employees subject to the jurisdiction of the central agency has been suggested as a minimum for satisfactory operation.

These features should be provided for by legislation. The functions which this central personnel agency can best perform are examination and certification, position-classification, service records, promotional examination and central record keeping. Other functions of personnel management which are concerned with the handling of men and women after appointment can best be performed by the appointing officers within departments. The appointing officers select one of three names certified for appointment, supervise and direct their work, conduct in-service training programs, impose disciplinary measures such as demotion, suspension or discharge, sometimes with an appeal to the central agency for review of discharge, make out service ratings and develop programs of employee safety and welfare.

The technical operations of a modern personnel department are covered in the rules and regulations and include the following: recruitment, examination and

certification, position-classification, compensation plan, probationary period, training, promotion, service records, discipline, and a sound retirement system. These functions constitute the minimum requirements for a sound workable merit system.

Recruitment involves more than mere announcement of examinations and passive acceptance of applicants. Its purpose should be to interest individuals of the highest capacity, ability, and character in entering the public service, and active search should be made for exceptionally well qualified applicants.

Examinations are essential to determine the qualifications of candidates and to test or measure the fundamental traits, aptitudes, and skills, and they must be conducted on an impartial, open, competitive basis.

The position-classification plan is one of the most difficult and technical tasks to be performed, yet one of the most important aspects of personnel work. It includes for each position a description of the duties and responsibilities and the requirements of minimum education, training, experience, and other qualifications suitable for the performance of the duties of the position.

The compensation plan establishes minimum and maximum salaries and annual salary increases for each position in the classified service. The compensation plan establishes equitable relationship between individuals performing the same type of work, fair relationship between different kinds of work, and a proper relationship between public and private pay levels.

The requirement of a fixed probationary period before permanent appointments are secured affords an excellent opportunity to evaluate the work of the employee in the position to which he has been assigned, and tends to keep incompetent and unqualified persons out of the public service.

The difficulty of training public employees before they enter the service makes it desirable to provide training programs after employment. The training program increases the effectiveness of the employees in the performance of their immediate tasks, and prepares them for promotion to positions of larger responsibility in the organization. One of the means of holding in the government service the best qualified men and women who enter the lower grades is to give them opportunities for promotion as vacancies occur. Final responsibility in promotion must be left to the department heads, but the central personnel agency can assist in the selection of those best qualified for promotion by conducting promotional examinations and by providing information regarding service records and efficiency ratings.

The need for disciplinary action which sometimes results in discharge arises from inattention to duty, tardiness, laziness, and carelessness, inefficiency, insubordination or disloyalty, intoxication, immorality or lack of integrity. Responsibility for disciplinary action must rest with the appointing officer or department head. Many types of discipline for minor infractions such as warning, reprimand, delay in salary increases, etc., are enforced by the head of the office or division on his own responsibility and without review. The use of more severe penalties, such as suspension, demotion, or removal usually requires action by the head of the department, and in many jurisdictions the employee is allowed to appeal to the civil service commission, and in rare cases to the courts. There are 4 methods of discipline in use in this country.

1. All disciplinary authority rests in department heads who have unlimited power to "hire and fire."

2. Removal can be made only for cause, but there is no review or appeal from the decision of the appointing

officer. This is the plan followed in the federal service, the state services of New York, Illinois, Ohio, and Wisconsin, and in many cities.

3. The employee has the right to appeal to the commission from the decision of the appointing officer. In this group are the states of Maryland, New Jersey, and Colorado, and the cities of Cincinnati, Detroit, Milwaukee, and others.

4. The employee has the right of appeal and judicial review as in Massachusetts and a few large cities. The widespread impression that a merit system employee cannot be effectively disciplined or removed is without foundation in most civil service jurisdictions. On the whole, there has been too little rather than too liberal use of disciplinary power. Orderly procedure in all cases of disciplinary action, including full publicity, is a minimum requirement. Protection against removal for reasons of politics, favoritism, race or religion is an essential element in any system. We should probably avoid the extreme protection afforded employees through review by courts, and appeals to the civil service commission should be exceptional and available only in unusual cases.

The purposes of a retirement system are:

1. To terminate the employment of persons who are no longer able to serve satisfactorily by reason of age.

2. To improve the morale of the force, by affording opportunities for advancement.

3. To make government service attractive to the best of the present employees by reason of the retirement benefits.

By 1938, twelve states had retirement systems. State-wide retirement systems which include not only state but county and city employees are the best type.

Membership in the retirement system should be compulsory at least for all new employees. Retirement should be compulsory at a certain age. The retirement system should be contributory, that is, both the employee and government should make contributions. The system should be established on a sound actuarial basis.

The issue ahead is not whether there shall be retirement systems, but what form they shall take. In view of the immense sums of money involved, the question deserves most careful study.

SUMMARY

Some suggestions have been made in this paper for establishing a sound merit system in those states which do not, at the present time, have a state system in operation, and certain adjustments which may be made in states which have an inadequate system have been presented. The various methods now in use for providing technical personnel service to counties and cities which cannot afford to set up their own systems have been reviewed. The essential features of a sound, workable merit system have been outlined as consisting of a merit system council with rule making powers, which would appoint a trained director of personnel who would be charged with the responsibility of performing all the administrative functions.

The minimum standards which are necessary to effectuate a sound merit system and which are covered in the rules and regulations have been briefly stated in outline form.

The Merit System and Public Health*

HARRY B. MITCHELL

President, U. S. Civil Service Commission, Washington, D. C.

THE Civil Service Commission is naturally interested in the extension of the merit system to the Public Health Service in the various states and to other state agencies that are similarly affected by the 1939 amendments to the Social Security Act. We believe it means a better understanding throughout the country of the value of selecting public servants through competition and as a result gradual extension of the merit system to other state and local offices. In the long run, that means better and more efficient service to the public at less money.

Our Commission has nothing to do with the new regulations to provide for efficient people to handle federal moneys paid through state governments, but it has agreed with the Social Security Board that, wherever it is desired by state authorities, the registers of the U. S. Civil Service Commission will be available to them, and appointments may be made therefrom. In every state we have available lists of residents of that state for all the clerical and other ordinary positions, and in some of them lists of persons qualified for some of the higher positions. Although these lists are available, it should be understood that we are not urging selections from them, except as a possible convenience to the states and communities. We recognize that in most cases the states or local communities will prefer to have their own machinery for the selection of employees.

At present there is no machinery for the selection of state employees by competition in many of the states which are included within the Western Branch of the American Public Health Association; and I realize the difficulties in working out a good system which will satisfy both the advocates of those who believe in selecting public employees through competition and those who believe that other factors such as political affiliation should enter into the picture. However, since all the state health departments administer maternal and child health programs under the Social Security Act, and many of them also administer crippled children programs, the problem will have to be solved if the states are to benefit by the federal appropriations for these purposes.

That there was need for more experienced and efficient employees in public health work in these state organizations even before the amendments to the Social Security Act is shown by the annual report of the Surgeon General of the U. S. Public Health Service, who, in his report for the fiscal year 1939 said:

> One obstacle to efficient administration in the states lies in the rapid turnover of per-

* Read before the Western Branch American Public Health Association, at the Eleventh Annual Meeting in Denver, Colo., June 27, 1940.

sonnel due to partisan political considerations. During the fiscal year, one-sixth of the state health officers were replaced. Such replacements are too often accompanied by the disruption of state and local health organization. The disastrous effects on morale and on programs of service, when appointments are not made on a merit basis, are such that appointment to all responsible professional positions in the state and local health organizations should be made under a merit system in each state. The establishment of such a merit system should be made a legal prerequisite to the receipt of federal funds for health work.

Following out this recommendation in his *Annual Report*, the Surgeon General, after the amendment to the Social Security Act, issued an order providing that where a merit system has been established in a state agency, it should apply to personnel in the state public health service. Thus, where there is a state merit system, positions in the public health service of the state which are directly affected by payments from the Social Security system would have to come under that system.

As I understand the situation, the agencies affected by the 1939 amendment are quite well along in their plans for putting its provisions into effect. In the states included in the Western Branch of the American Public Health Association, there are, however, few states which have a merit system of their own; and in some of the states where such a law is in effect it appears that the authorities are not always insistent that it be rigidly enforced. In some of these states the existing laws make it very difficult to install a merit system in the central state agency; and even more so when it comes to dealing with the local authorities in the counties and cities.

Where there is no merit system in the state, the agencies affected are endeavoring to operate through what they call "joint merit councils." The members of these councils, appointed by the governor of the state, or by the heads of the agencies affected, are supposed to be independent of any political control, and find by competition or otherwise the most competent persons available for the jobs to be filled. This plan seems fine as a makeshift, but it should only be regarded as a makeshift. As an entering wedge, it will probably have good effect in educating the public up to the necessity of laws, but the people of the state should never be lulled into the belief that it will suffice, no matter how well it seems to be working temporarily. It might work all right when one governor is in office, but not work at all with his successor.

For almost a century, the system of patronage appointments to public work has been strongly entrenched throughout American political life. For fifty years there has been almost constant effort to replace it by the merit system in federal appointments. Gradually there has been improvement, but it has been something of a struggle most of the time, with now and then retrogression. During the past few years there has been much progress; and if the Ramspeck bill is passed during the present session of Congress the employment of federal executive employees because of political affiliations may soon be a thing of the past. This condition exists largely because there has been in the White House a man who is a convinced and insistent advocate of the merit system in federal employment, and also because in Congress that system has had friends like Congressman Ramspeck, who are untiring in their efforts toward its extension.

Naturally, believers in the policy of selecting employees by competition would like to see this policy extended to the states, the counties, and the cities. The Social Security Act of 1939 provides that, after January 1, 1940, state employees who have to do with the handling of federal funds apportioned from the Social Security appropriation

shall be under a merit system. However, it is explained by the Board that it has "no authority with respect to the selection, tenure of office, and compensation of any individual employed in accordance with such methods." Therefore, it is quite clear that in the work carried on by the members of your Association, you will have to secure employees in a manner approved by the state authorities—or local authorities in many cases—and in accordance with the laws presently in force. While undoubtedly most of these state and local officials will work with you in putting into effect the provisions of the Social Security amendment, and the orders resulting therefrom, I imagine that there are a few—particularly among local officials—who are going to be hard to convince that their friends are not entitled to any available jobs.

There is continual complaint about the number of people in the government service. There always has been complaint of that sort, just as there always has been complaint that taxes are too high. Probably there always will be such complaints. However, if by evil chance we should be compelled to adopt a totalitarian form of government, the number of office holders would undoubtedly be greatly increased and the proportionate taxes greatly increased. In other words, the proportionate number of office holders and the proportionate amount of taxes is much greater in Germany and Russia and Italy than in the United States. Apparently it is true that proportionately there are also more people paid by the government in other European countries than in the United States, and there is no doubt that taxes are higher in most of them; not, however, to the degree that prevails in the totalitarian countries.

As all of you doubtless know, there are complaints about the money spent for public health. This is more evident in local opinion than in national opinion. I remember when, as mayor, I was endeavoring to help get a full-time health office established in my own community. The opposition was largely based on the ground that we had gotten along fairly well for many years without this additional expense and that its establishment meant more taxes. Undoubtedly, all of you who have been engaged in pioneering along your line have encountered the same sort of opposition. In fact, in the particular case that I refer to, I do not believe we could have been able to win if it had not been for the counterargument that the federal government was going to carry a good share of the initial expense. For the first few years the continuance of that full-time office was rather precarious. With the passage of time that opposition has all disappeared. Undoubtedly the members of your Association could tell of hundreds of similar experiences throughout the United States.

The health of federal employees is a matter that has given the Civil Service Commission considerable concern. It has in its charge the administration of the civil service retirement system. That system provides for retirement for disability as well as annuities for aged employees. During the fiscal year ending June 30, 1939, the total number of persons placed on the retirement list numbered 5,796; and of that number 2,144, or 37 per cent, were retired for disability. Not only are these disability cases a very large drain on the retirement fund, but there is also an unmeasurable loss in the removal from the service of many otherwise competent employees, and in sick leave that might be prevented under proper medical care —such care as is provided for their employees by many corporations engaged in private business; and who find it to their material advantage to provide such care.

While the federal government is not giving the same attention to the health

of its own employees in the executive service as the better class of industrial corporations do, there are a great many physicians and nurses employed in various governmental agencies in connection with the public health work, as well as those engaged in caring for the health of the Army and Navy, of those who have been in the Army and Navy, and of the Indians. In the Army, there are 1,210 commissioned officers who are physicians, and in the Navy 896, not including reserve officers in either service. In the civil health organizations, many physicians are employed on a part-time or fee bsais. The latest available figures show that the Public Health Service has 469 commissioned physicians in regular active service; 109 commissioned reserve physicians on active duty; and 350 selected from civil service registers. These are connected with Public Health Service, but some are actually employed in the penal institutions of the country. The largest employer of physicians and nurses on a permanent basis is the Veterans' Administration. In that organization there are 1,633 doctors employed on full time, and 243 employed on part time; 1,151 specialists and consultants are employed on a fee basis; 5,795 medical examiners (local doctors) are employed on a fee basis. The same agency employs 4,267 nurses. There are 967 nurses employed by the Public Health Service and about 638 in the Indian Service. In the latter service, there are employed 179 full-time physicians and about 112 part-time. The U. S. Employees' Compensation Commission has a list of nearly 5,000 physicians who are authorized to act for it on compensation cases, and who are paid on a fee basis. Farm Security Administration has 83 paid on a per diem basis, and scattered throughout the executive service generally there are many additional doctors and nurses employed.

While the Civil Service Commission has no statutory responsibility for protecting the health of civil service employees, nevertheless, because of the retirement system already referred to, it has to exercise care in order to prevent people from getting into the service who may later become an expense to the government through disability; or who, because of physical condition, may be inefficient or a danger to their fellow workmen. Every applicant for an examination finds in the application blank that is given to him a question which requires him to state any physical defect or disability which he may have, and to give full particulars. We do not stop with the applicant's own statement. For practically all permanent positions a thorough physical examination by a federally approved medical officer is required. Most of these examinations are made by doctors in the Veterans' Administration or in the Public Health Service, but any authorized government physician may examine an applicant. Report is made by the examining physician to the Civil Service Commission, and its Medical Section passes on the question as to whether any physical disabilities are shown which would disqualify an applicant for the federal service.

We have a good deal of trouble over physical disabilities, and during 1939 our Board of Appeals and Review handled 2,896 appeals from decisions on physical condition. That means a lot of work, and that work is materially increased by the tremendous amount of correspondence which we have concerning these cases.

As previously stated, you are not likely to have much trouble in getting all public health employees on a merit system in the states where there is a civil service law rigidly enforced. I understand that in the other states it is ordered that by July 1, 1941, they will have to have their employees under the merit system or appropriations will

be cut off. That is going to make trouble, but apparently extension of time is going to be granted only under very unusual circumstances, and then only until necessary legislative action can be taken.

In conclusion, may I repeat that the U. S. Civil Service Commission is intensely interested—because of its importance in the problem of government—in the successful outcome of the program which you are now engaged in putting into effect. There are difficulties ahead, there will be disappointment and sometimes reverses. That is to be expected in a situation such as confronts you. Nevertheless, the end sought is well worth the trouble and the difficulties. In attaining that end, let me assure you that you have the very best wishes of the U. S. Civil Service Commission.

Health and Medical Preparedness*

THOMAS PARRAN, M.D., F.A.P.H.A.

Surgeon-General, United States Public Health Service, Washington, D. C.

THE most impelling problem which we face today is that of maintaining the safety of this country and its institutions. For their aggressive defense, we are gearing up governmental methods; mobilizing resources and man power.

For the first time in all history, world events have thrust upon us the concept of a total war. In preparing a total defense, all factors ultimately rest upon the one fundamental resource of the country, *man power*. Medicine and public health, through the centuries, have been devoted to the conservation of man power and its socially constructive use.

Pursuant to the Act of July 1, 1902, you have been called today to meet for the consideration of ways and means by which we may take the first steps, through coördinated federal and state action, to conserve and utilize the vital resources of our country for national defense.

In addition to the State and Territorial Health Officers and our National Advisory Health Council, I have invited the representatives of other federal agencies concerned and of professional and voluntary agencies. This is desirable because of the complexity of many of the problems with which we are faced. Also, we need now, as never before, an integrated effort on the part of all agencies which represent the purpose of our citizens to attain personal and national health.

The federal government has planned a closer coördination of health activities to promote national defense than we have known before. We have now a coördination of civilian health problems with social welfare, children's problems, nutrition, and other consumer interests under one of the seven members of the Advisory Commission to the Council of National Defense. We may anticipate, soon, a further coördination of medico-military and health defense problems as a major preparedness measure.

The immediate problems which you have been called to consider are listed in the program for detailed discussion. I shall refer to them briefly.

The Selective Service and Training Act contemplates the registration of about 16½ million men, the physical examination of 2 to 4 millions, and the induction into military training of several hundred thousand. There is a clear necessity for maintaining a balance between facilities to care for the civil and industrial needs on the one hand, and the needs of the military services on the other. This leads to considerations of recruitment policy; the status of key personnel in essential health and medical service and training programs to insure an uninterrupted output of professional personnel for both civil and military demands.

* Excerpts from address before the State and Territorial Health Officers and National Advisory Health Council of the U. S. Public Health Service in Washington, D. C., September 16, 1940.

Among the 16½ million registrants, there will be found countless physical defects and many cases of communicable disease. For example, a large proportion of the acute syphilis is among this age group. Here will be 300,000 foci of infection going into the registration booths. Have we the energy and the vision to offer a blood test to these men? It is a major opportunity to mobilize all of our public health and medical effort to find and stamp out perhaps the larger portion of this menace to national fitness. We shall have much to do in providing isolation and care for the many active cases of tuberculosis which will be found on draft examinations. We should do it for trachoma.

Even though our physical status may be better than in 1917 and 1918, we know that a large segment of the registered population will be disqualified for military service because of physical defects, many of which are remediable. What are the ways and means in which public health and medical agencies may contribute to their rehabilitation?

Of immediate concern also are the sanitary and health emergencies created by the mobilization and military maneuvers of large bodies of troops in many states. The situation raises questions of military necessity, federal versus state relationships, and even suggests the need to consider some plan for regionalized administration.

Industrial mobilization and expansion coincides with military mobilization and expansion. Although we have made progress, we still are far from solving all the long-time problems associated with occupational accidents, disease, and physical impairment among workers in ordinary times. Defense preparations have greatly augmented these problems, and created acute new ones.

We are not yet geared to protect men working in the new and hazardous processes being introduced, nor are we prepared to alleviate the burdens upon the housing, medical, and health facilities of the community imposed by large population shifts to expanded industries.

Although more than 30 state industrial hygiene units have been established during the past 4 years, most of them consist merely of an organization nucleus inadequate to meet current problems effectively. Just as we now have insufficient air, naval, and land forces to meet every threat to our safety, so we have also insufficient forces trained in industrial medicine, public health, and sanitation to serve our military, civilian and industrial needs. One of the narrowest bottlenecks is the shortage of men trained for industrial medical service. Whose responsibility is it to meet this need? If our industrial machines are the most efficient in the world, the men and women who operate them should have a comparable efficiency.

Further, I would call to your attention the status of the 500,000 young people between the ages of 18 and 21 to be employed by the National Youth Administration, many of whom are being trained in skills needed by defense industries. The boys will be of military age soon. If we do our part now, both industry and the armed forces will be spared some of their present problems. The National Youth Administration, with the help of the Public Health Service, is developing a health program to be carried out in the several states. If it is to be successful, state and local health agencies and the medical and dental professions must participate actively.

And finally, may I suggest that the immediacy of these (and any other matters to be discussed) should not prevent your viewing them at long range. It is true that the world picture changes almost overnight, and that overnight our own needs may become much more acute. From my own point of view, however, we should plan for the long haul. It does not seem likely that the

situation in which we find ourselves will be resolved in 6 months or a year—perhaps not for many years. Nevertheless, we have this enduring satisfaction, that what we do here, if it be well done, is imperative for safety in war but is even more greatly productive for permanent peace.

Whatever the future holds for us, our effort *cannot* be wasted. We build for a strong, a vigorous America, eternally ready for tomorrow.



Annual Membership Roll Call, November 11–30, 1940

Illness Due to Commercially Prepared Egg and Olive Sandwiches Contaminated by a Probable Carrier of Hemolytic Staphylococcus aureus

J. C. GEIGER, M.D., F.A.P.H.A.,
AND A. B. CROWLEY

Department of Public Health, City and County of San Francisco, Calif.

WITH the advent of the repeal of prohibition, a comparatively new food manufacturing industry for the commercial preparation of sandwiches developed. In some states, in order to dispense liquor legally it is mandatory to offer for sale foodstuffs on the same premises. This requirement has been met in many instances by the use of wrapped sandwiches. Usually these sandwiches are prepared by wholesale purveyors and are distributed each day by truck.

In June, 1939, inspectors stationed at the San Francisco Golden Gate International Exposition reported that certain Exposition employees had complained of illness after having eaten "D" Brand minced egg and olive sandwiches. The Department of Public Health made an investigation in San Francisco, where "D" Brand sandwiches were prepared. Inspection revealed an exceptionally well conducted establishment. Foodstuffs were of good quality, properly handled, stored, and cared for under adequate refrigeration.

Investigation of the method of supplying sandwiches to the Exposition on Treasure Island disclosed that service trucks visited the sandwich stands only in the morning. Fresh sandwiches were supplied only when the stock was 48 hours old.

Apparently, the age of a sandwich was determined by the position of a clamp that fastened the wax paper wrapper, an unsatisfactory method of identification. Therefore, distributors were required to identify their products by attaching colored strips of paper to the clamp, various colors indicating the day of the week on which the sandwich was prepared, replacements to be made each 24 hours.

On July 15, 1939, further reports of food poisoning were received. The symptoms were nausea, vomiting, abdominal pain, and diarrhea, the incubation period being about 5 hours.

On July 21, more cases of illness were reported. Laboratory examination of freshly prepared sandwich mix was negative.

On July 24, more cases were reported. Inspectors obtained from Exposition Stand K-73 sandwiches that had been prepared from the same mix. Laboratory findings were again negative for organisms of the food poisoning group, with the exception of one sandwich, in which hemolytic *Staphylococcus aureus*

was demonstrated, but the colonies on plates were few.

On August 25, more cases were reported both in San Francisco and at the Exposition on Treasure Island. Minced egg and olive sandwiches, "D" Brand, had been consumed, and symptoms of food poisoning resulted. Samples of these gave many hemolytic *Staphylococcus aureus* colonies. Examinations for other food poisoning groups of organisms were negative.

Laboratory findings indicated a possible specific area or island-like contamination of the ingredients. The resultant growth of the causative bacteria was probably dependent upon several factors—pH of individual ingredients, pH of final mix, thickness of the spread, temperatures at which sandwiches were kept, and the elapsed time between preparation and consumption.

Further inspections at night at the factory allowed close observation of all processes in preparation. Every method was used to watch the movements of all employees, and notations were made of possible sources of contamination.

There were 5 women engaged in the actual making of sandwiches. Butter was first placed on the bread, the sandwich mix then spread, and the sandwich cut into triangular halves. This was all done on wooden trays, previously washed and scalded. Each tray when full contained 24 sandwiches. The full trays were then passed on to 2 women who wrapped and sealed each sandwich. One man was employed in the kitchen preparing mixes and providing materials for the final sandwich.

Promiscuous use of the hands by all employees was noted, care being sacrificed for speed. All kitchen utensils, mix crocks, spatulas, etc., were kept scrupulously clean. Personal hygiene and clothing of all engaged in the handling and preparation of all foodstuffs were exceptionally good.

The preparation of minced egg and olive sandwiches was as follows: hard-boiled eggs, cooked and peeled the previous morning and stored in the ice-box in deep aluminum pans (elapsed time approximately 12 hours), were minced in an electrical rotary chopping machine; the minced eggs were then placed in a large stainless steel mixing bowl; stuffed green olives, minced in the same manner, were added to the eggs; the contents of a small can of pimientos were minced and added; transfer of all minced foods from mincing machine to mixing bowl was done with the hands; and, at this point, sufficient mayonnaise was added to bring the mix to a creamy consistency by further mixing with the hands. The mayonnaise was made approximately every 24 hours in quantities of 10 gallons. Ingredients used in the mayonnaise were salad oil, from 50 gallon drums, and a commercial product called "Emulsol," or frozen egg yolk. The completed mixture was transferred to smaller receptacles and brought to the work benches of the sandwich makers. The mix was then spread on buttered bread by means of spatulas, and the sandwiches made as previously described. All utensils used in the process were washed in boiling water and dipped into a chlorine solution each night before storing in clean, closed compartments. Before use, all utensils were immersed in boiling water for 3 minutes. The employees responsible for the sandwich mix thoroughly scrubbed their hands and arms with hot water and soap, using a fingernail brush, and then dried with a clean towel before handling any of the foodstuffs.

Samples of all foodstuffs were taken at various stages of preparation. With the exception of the "Emulsol," all laboratory findings were negative. The latter contained a few coliform colonies. The pH of various ingredients was: "Emulsol," 6.08; salad oil, neutral;

olives, 3.74; mayonnaise, 4.32; sandwich spread (final product), 5.3; and the salt content 7 per cent.

It was obvious that changes were necessary, particularly, reduction in the use of the hands. The important changes ordered were: adoption of mechanical mixers for all operations; replacement of the sandwich make-up boards by metal trays; installation of a roll of soft tissue paper towels at each work bench so that frequent wiping of hands would be easy; sterilization by boiling for 5 minutes of all spatulas between uses; and the scalding of peeled eggs prior to storing in refrigerator. As the result of strict adherence to the new requirements the bacteria count of the egg-olive sandwich mix was reduced from many million to 40,000 per gram.

On September 22, additional cases of food poisoning were reported. On this date an automobile sales company provided its employees with a light meal in the late afternoon. The temperature on this day reached 94.8°. The food provided by this firm consisted of assorted sandwiches, " D " Brand. Approximately 50 people ate these and 38 became ill with symptoms of food poisoning. Investigation revealed that "D" Brand minced egg and olive sandwiches had been eaten by all who became ill. Samples were taken for laboratory examination. The only positive findings were in the " D " Brand egg and olive sandwich, the hemolytic *Staphylococcus aureus* being readily demonstrated.

Another investigation of the premises and processes employed at " D " Brand company showed that, while other former orders were being followed, the scalding of peeled eggs prior to storage was not carried out. Although the water was boiling when the first eggs were dipped, by the time that the last of them were treated, the water had cooled to a degree that was not effective. This was immediately corrected.

The actual source of the contamination not having been determined, physical and laboratory examinations of all food handling employees of this concern, 12 in number, were made. These were done in the Isolation Hospital of the Department of Public Health. The examinations, besides complete physical observations, consisted of laboratory examination of stools; urine; material from the fingernails, the ears, the skin, and the nasopharynx. The results showed that the excreta of all employees were negative for organisms of the paratyphoid-enteriditis group. Cultures were obtained of a non-hemolytic *Staphylococcus aureus;* non-hemolytic *Staphylococcus albus;* and non-hemolytic streptococcus. Cultures from the ears of several employees showed a hemolytic streptococcus. Cultures of the skin from 4 employees showed a hemolytic *Staphylococcus aureus*. Reëxamination of these 4 resulted in skin cultures showing a non-hemolytic staphylococcus with the exception of " O " who peeled all of the eggs. Further examinations of " O " repeatedly demonstrated pure cultures of hemolytic *Staphylococcus aureus* from the ears; the fingernails, the skin, and the urine. This employee was regarded as a carrier, removed from the preparation of the mix, and assigned as a driver of a truck. There have been no further cases of food poisoning reported from this source.

SUMMARY AND CONCLUSIONS

Fifty-nine recorded cases of illness from food occurred in San Francisco, June to October, 1939. Investigation indicated the causative food to be commercially prepared minced egg and olive sandwiches. Careful inspection of the premises of the manufacturer showed a high degree of plant sanitation.

Physical and laboratory examinations, including examinations of stool and urine specimens, skin scrapings, material from under fingernails, from the ears, and from the nasopharynx were made.

One employee, "O," whose routine duties brought close contact with some of the ingredients used, was repeatedly shown to harbor hemolytic *Staphylococcus aureus* in the ear, under the fingernails, on the skin, and in the urine. The results of the physical examination were negative. On October 3, 1939, "O" was removed and placed in outside work that did not require contact with food products. Further cases of food poisoning from this source have not been reported.

Carriers of the hemolytic *Staphylococcus aureus* are of decided epidemiologic interest. Observation of methods employed indicated that the contamination probably took place during the peeling of boiled eggs used in the mix. The measure provided to prevent any possibility of contamination during the preparation of the sandwich mix was to scald all peeled eggs prior to mincing, and the removal of the probable carrier. The hemolytic *Staphylococcus aureus* isolated from the probable carrier were submitted to the George William Hooper Foundation for further study.

The total number of sandwiches prepared and distributed each day averaged 4,000. Of this number, 200, or 5 per cent, were minced egg and olive. The largest percentage consisted of assorted meats, cheese, poultry, fish, and plain minced egg.

Thirty-five kinds of sandwiches were prepared. The probable carrier had as much contact with ingredients of the last mentioned group as with minced egg and olive. No cases were reported or traced to any sandwich in the miscellaneous group. "O" had worked in the same position for 3 years prior to the first outbreak.

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SIXTY-NINTH ANNUAL MEETING—DETROIT

MANY who were present at the 69th Annual Meeting were in Detroit in 1924—sixteen years ago. All of us who at that time enjoyed the hospitality of Detroit, as administered directly by Henry F. Vaughan, genial health officer of the city, knew what to expect. We were not only not disappointed, but things were better than ever. At our last meeting in Detroit it had a population of 900,000 and today it is rated at 1,620,000, and everything else has grown also. In 1924 the Association used one hotel, the Statler; at the 69th meeting, not only for housing and entertainments, we used the Statler and the Book-Cadillac with the meetings, etc., about equally divided. For the first few days, as far as interest and attention went, we had a strong rival in Detroit's wonderful baseball team, but the team went to Cincinnati and the tension lessened.

The Seventh Institute on Public Health Education had the largest attendance on record, and even the day before the meeting, the registration had reached more than 800. The Institute was attended by about 350 members of the Association. One of the values of the Institute proved to be the opportunity for members of various Sections, engaged in many phases of public health work, free from other responsibilities for two days, to meet together to give active consideration to major topics of mutual interest in public health education.

The total registration was 3,083.

The other organizations meeting with us always add interest. On Monday the Michigan Public Health Association had its annual meeting and luncheon to which the President this year, Dr. Henry F. Vaughan, was good enough to invite a number of public health workers from various parts of the country. There was a large attendance climaxed by the presentation of keys to a number of former presidents. Altogether it was a delightful and instructive session.

The scientific sessions have been, if possible, more interesting than usual. Anyone who has watched from year to year, notices the trends. At this meeting two anniversaries were observed—the Laboratory Section celebrating its 40th birthday, and the Epidemiology Section its 10th; yet for the past year the latter has led all other sections in the amount of material offered and to which space

has been given in the JOURNAL, while the Laboratory, which has led for many years as the largest, has fallen slightly behind. Another section which has come to the fore is Food and Nutrition—it also accounting for many excellent papers, being one of the three for which much space has been given in the JOURNAL.

The shadow of the tragic events which have occurred and others which seem all too imminent has necessarily fallen on all of us. Affairs in Europe and their influence on our own country, and others closely in touch with us geographically, and as constituent members of the Association, have been reflected in our program. On the day preceding our meeting proper, the American Social Hygiene Association put on a remarkable program directed to consideration of the health of our soldiers and sailors as regards venereal diseases. Much the same program, but enlarged, was given again on Wednesday, in which the Surgeon General of the Army, the Surgeon General just preceding him, and a representative of the Surgeon General of the Navy, as well as others, took part. On Friday the Fourth General Session was given over to the control of communicable diseases under war-time conditions. The Presidential address by the incoming president, Dr. W. S. Leathers, was also devoted to the general subject of preparedness.

One is tempted to select from some of the programs outstanding papers, but space does not permit, owing to the general excellence of the program in which every one of our ten Sections was notably and excellently represented.

We have already spoken of three of our Sections as showing great growth. It is striking to note that food and nutrition has played a necessary part in our program of preparedness. We can all remember the 1917 slogan "Food Will Win the War" which in effect has been changed to "Proper Nutrition Will Win the War." Notable in this general program also is the increasing interest in food poisonings due to the staphylococcus, which has been noted in our JOURNAL for several years, but the importance of which is being constantly recognized more and more.

We must also mention the increasing interest which has been shown in oral hygiene. This is evidenced in excellent papers by members of our dental group. We can all remember when our program was devoid of such studies.

The hospitality of Detroit to the Association, individually and collectively, and especially to the visiting ladies, has been notable. It seems unnecessary to say that in the motor center of the world visits to some of the great industrial plants connected with this industry, now turned so largely to war work, have been in the forefront. The ladies have been taken care of by sight-seeing trips and teas. Excursions were made to Detroit's Health Department, Water Works and to the Biologic Laboratories.

Giving an idea then to the national character of our meeting, we mention the following: Mexico was represented by Dr. Angel de La Garza Brito; Puerto Rico by Dr. Oscar Costa-Mandry; and Cuba by Dr. Victor Santamarina and Mr. Gustavo Bequar. While we could wish for a larger representation of our brothers from the south, they were worthily represented by these gentlemen. Honolulu was represented by Dr. Philip S. Platt, Mr. Samuel W. Tay, and Miss Mary Williams; New Zealand by Miss Elizabeth Gregory; Venezuela by Dr. Leon Frioda; and Peiping, China, by Dr. I. C. Yuan; Alaska by Dr. Courtney Smith; Norway by Dr. Karl Evang. Our constituent member on the north, Canada, was represented by some 43 of our old friends, though many of our standbys were prevented by war work from being with us—the delegation from Canada representing the country from Vancouver on the west to Halifax on the east. Notably,

we have been honored by the presence of Miss Elizabeth L. Smellie, one of our vice-presidents, who is now doing war work in the Dominion.

The scientific exhibits were excellent, but the list is too long to itemize. The commercial exhibits were also of very high quality and varied. The weather was perfect and no accidents happened to mar the thorough enjoyment of those fortunate enough to attend.

The Annual Banquet was an unusual success, attended by some 900 persons—so much so that the Grand Ball Room of the Statler was unable to hold the banqueters.

All who have been fortunate enough to attend the Detroit meeting will sincerely hope that another invitation will come to the Association to meet there in the not too distant future. While the citizens of Detroit, and its officials, have shown every courtesy and provided every convenience, it is to Henry F. Vaughan, the Health Commissioner, that the Association owes particular thanks, and, with the hope that we may return as soon as possible, we also hope that Henry Vaughan may still be the Health Officer as well as the most efficient and genial host.

The resolutions adopted cover practically everything that need be said, but to Henry F. Vaughan particularly, a special tribute is due. We close by giving the substance of a resolution adopted: that the Association will continue to devote itself to the maintenance of health and to our continuance as a free people.

JOHN L. RICE, M.D.

DR. RICE was chosen President-Elect of the American Public Health Association at the Detroit meeting in October. At this time, Dr. W. S. Leathers, Dean of the School of Medicine of Vanderbilt University, became President, and Dr. Edward S. Godfrey, Health Commissioner of New York State, retired as President.

Dr. Rice was born in Granby, Conn. He received his B.S. degree from Wesleyan University and his M.D. from Johns Hopkins Medical School. In 1934, he was awarded an honorary M.A. degree by Yale University and an honorary M.S. degree by Wesleyan University.

After graduation from medical school in 1917, he began his career as a public health official, which he has continued uninterruptedly. He served in 1917 and 1918 with the International Health Board of the Rockefeller Foundation in Costa Rica and Guatemala, studying tropical diseases and methods of controlling them. From May, 1919, to July, 1920, he was County Health Officer of Mason County, Ky., and from August, 1920, to September, 1921, he was a District Health Officer



John L. Rice, M.D.

of New York State. During the period 1921–1923, he was engaged in public health work in Trinidad, B. W. I., and in Puerto Rico, for the International Health Board.

In 1923, he was selected as Commissioner of Health of New Haven, Conn., and served that city until January, 1934. Since that time, Dr. Rice has been Commissioner of Health of New York City, in which capacity he still serves.

Among others, Dr. Rice is a member of the Academy of Medicine of New York City, New York State Medical Society, a Fellow of the American Medical Association. He is a Captain in the Medical Reserve. He has been a member of the American Public Health Association since 1920, and a Fellow since 1926. He served as Secretary of the Health Officers Section 1930–1933 and as Chairman in 1934. He was for many years a member of the Committee on Administrative Practice and served as Chairman of its Sub-committee on Health Department Reports. He was a member of the Governing Council 1937–1940, and served as a member of the Executive Board 1934–1938.

LILLIAN WALD

TO many people throughout the world the death of Lillian D. Wald on September 2, brought a sense of deep personal loss. Few of us are so fortunate as to possess her great love of people and capacity for friendship, or her sense of relative values which gave her a rare appreciation of the worth of the individual. Young or old, rich or poor, lowly or mighty—it mattered not to her so long as the individual was striving for spiritual growth; and her faith in each was frequently the factor which made that growth mature.

The story of her pioneering efforts on the Lower East Side of New York City is well known—of her going as a young nurse with a companion in 1893 to live among those whom she would help. There she founded the "Nurse's Settlement" on Henry Street which with the passing of years developed into a Settlement House with an extensive program of neighborhood activities, and into a Visiting Nurse Service which today employs annually a staff of nearly 300 nurses who visit in the homes in three boroughs with a population of 4,500,000.

That Henry Street is the largest Visiting Nurse Service in the world is not specially to her credit, for she lived in an age of expansion and New York prides itself on size, but the rare quality of her leadership is much better portrayed through her insistence on keeping a real personal quality in the service in spite of its volume, on her insight into human needs and her creative genius which could translate these needs into action. There was a statesmanship in her leadership such as is seldom found. Early in her career she saw that the private agency could not function alone, so her efforts were directed continuously toward the development and strengthening of health and welfare work through public funds. First demonstrating the values of the public health nurse in the teaching of child health in the home and school, in 1902 she persuaded the New York Board of Health to develop a public health nursing program in its Health Department.

It was Lillian Wald who chiefly was responsible for the development of a department in the federal government whose concern should be the welfare of the child. From her earliest days she fought child labor, and worked for legislation to protect women in industry and to promote better housing. Hers, too, was the idea of the development of the rural public health nursing service begun by the American Red Cross in 1912. Due to her efforts, working closely with

Frankel, the Metropolitan Life Insurance Company was persuaded to experiment with the provision of public health nursing for industrial policy holders—a service which today offers nursing care to 18,000,000 policy holders throughout the United States.

Lillian Wald was one of the founders of the National Organization for Public Health Nursing, and its first president in 1912. Courage to fight for her beliefs in spite of cost, led her to become the champion of the oppressed wherever she found them, thus translating her faith in the democratic ideal into vigorous action.

Today public health nurses have 50 years of experience on which to determine policies and principles of work. It is significant that as a pioneer in a new field, without experience or precedent, Lillian Wald day by day developed those same principles which we still accept. She saw the public health nurse as a teacher as well as a nurse; she felt keenly that the giving of relief to the poor is much less desirable than the securing of work for them; and she believed that the agencies which care for the sick must work together closely if patient and community are to be well served.

Always sensitive to the changing times, she watched with interest and satisfaction the development of better teamwork between the professional and lay workers, of group effort, of community planning to cover the needs and eliminate duplication, of the increase in public funds for all fields of social betterment—and spent her last years developing an active lay group for the Henry Street Visiting Nurse Service that would carry on the work which she was leaving. Her going is a challenge to us who remain to strive for wisdom to meet the needs of the next difficult years with some, at least, of that same quality of creative imagination and generous foresight with which she faced each day's problems.

With that challenge, to those who knew her, is left too the memory of her love of beauty and insistence on it in the common things of each day's living, of her wit, of her gaiety—it was an inspiration but also a great joy to have known Lillian D. Wald.

MORE STRENGTH FOR THE STAFF OF LIFE

THE desirability of restoring lost nutrients to the national diet by the device of adding certain essential vitamins and minerals to staple foods was stressed editorially in this *Journal* more than a year ago.[1] Since that time, considerable progress has been made in this important matter, both in this country and abroad.

Of particular significance was an announcement in the British House of Commons in July, 1940. According to an official of the Ministry of Food, the government and the Millers' Mutual Association had agreed that vitamin B_1 (thiamin) and calcium would hereafter be added to all white flour, thus restoring to it valuable food factors that are reduced in the milling process, and making this product virtually equivalent in nutritive values to the much less popular whole wheat.

Similar progress is being achieved in the United States by the voluntary action of our milling and baking industries. Not only are most of the larger mills and many of the smaller ones now distributing white flours enriched in thiamin and other vitamins, but high-vitamin yeasts which impart thiamin in adequate amounts to white bread, and crystalline vitamins for fortifying the dough, are now generally available. Recent reductions in the prices of these

materials have made it possible to restore thiamin to white bread at a cost of only a small fraction of a cent for a one pound loaf.

Unlike their British colleagues, American bakers are accustomed to use liberal amounts of milk or milk solids in making white bread, a practice which not only adds protein of high biological value to the loaf, but increases the content of dietary calcium, so that our bakers' modern white bread is equal or superior to whole wheat bread in this important respect.[2]

According to the American Institute of Baking, several thousand bakers in this country are now producing white bread which has been enriched in vitamin B_1 by one of the several acceptable methods, and the number of bakers making this bread and the amount of it that is sold are both constantly increasing. This is gratifying progress and a real contribution toward an improvement in our national nutrition.

Despite the perennial declaiming of nutritionists in favor of whole grain products, white bread always has been and probably always will be preferred by the vast majority of consumers, who appreciate its easy digestibility, superior flavor and taste, finer appearance, and its unique value as an economical source of necessary food energy. More strength is, however, added to the Staff of Life when it is enriched in vitamin B_1, and all consumers should be encouraged to demand this new and advanced type of bread.

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2. Prouty, W. W., and Cathcart, W. H. The Calcium Content of White Bread. *J. Nutrition*, 18:217 (Sept.), 1939.

REMOVAL NOTICE

Late in October, the American Public Health Association, in company with other member agencies of the National Health Council, moved from 50 West 50th Street to 1790 Broadway, at 58th Street, New York.

Credit Lines

A Digest of Diversified Health Interests

D. B. ARMSTRONG, M.D., AND JOHN LENTZ, M.S.

CONCERNING LITERATURE DISTRIBUTION

Annual reports of health and welfare agencies come to our desk by the score and one item which always catches our eye is that having to do with the amount of literature distributed. Distribution figures in these reports often run into truly staggering sums, and with furrowed brows we are led to ponder this question: how much of this health literature was wisely distributed according to a well conceived plan, and how much of it was distributed haphazardly? Everyone will admit that a great amount of health literature goes to waste. Evidence of it is fairly common. For instance, we have seen adults pick up a number of booklets at random, thumb through them, and quickly cast them aside as waste basket fodder. Perhaps such individuals should not be criticised too much for this disregard of printed materials inasmuch as great stacks of literature usually adorn reception room tables on which a "Help Yourself to These Booklets" sign is displayed. If fewer booklets were placed within reach of the public, one might be less inclined to raid the pamphlet supply. Moreover, we have seen children—mere tots at that—walk off with an assortment of pamphlets having no more relation to child health than a toy boat has to the Queen Mary. Of course, a child cannot be expected to exercise discrimination in such matters, but an attendant might be on hand to prevent such waste of literature. (On second thought, perhaps these youngsters were taking the booklets home to daddy!)

Certainly our health literature accomplishes far more good when it is distributed along carefully supervised lines or given out by an attendant only in response to specific requests. And it would be well to remember that distribution figures running into hundreds of thousands do not necessarily imply that a good health education job has been done.

It strikes us that the safety officials of Wayne County, Mich., have made an interesting experiment in pamphlet distribution. In the August issue of *Public Safety* this new and effective method of distribution is summarized. Here is a description of the distribution project:

> "Door bells have been ringing at all Wayne County, Mich., homes which front on paved highways.
>
> "And when Mrs. Wayne County Housewife answered her door bell she found a uniformed deputy sheriff waiting.
>
> "'Goodness gracious, officer, what's this all about?' she inquired.
>
> "'It's really something serious,' the officer replied. 'But this little leaflet (which he hands to her) explains the situation thoroughly.'
>
> "It is safe to wager that nine times out of ten the title on the leaflet's cover—'Are Your Feet Killing You?'—and the fact that the leaflet is distributed by a deputy sheriff, causes the housewife to sit right down and start reading.

"So far as we know, our county was the first in the country to distribute an illustrated safety message pertaining to the problem of the rural pedestrian. Along with their regular patrol work, it took the traffic officers of the sheriff's department approximately 5 weeks to cover all homes along the 300 to 400 miles of paved roads in the county outside Detroit.

"Since we started our program in June, we have delivered 10,000 leaflets, etc."

We believe that the literature thus distributed drove home many a valuable safety message and that few, if any, of the pamphlets were wasted. Health departments might do well to employ similar distribution schemes in connection with special educational campaigns.

A THEATRE MANAGER LENDS A HAND

An unusual mixture of advertising copy and health information comes to us from the Dixie Theatre, Abbeville, La. The newspaper advertisement which this theatre ran following a recent storm and flood in that sector was devoted to a timely health precaution, as well as to an announcement of the theatre's screen program. Moreover, the health information is—in the parlance of show business—given "top billing" over the feature film. The advertisement is so unusual that we reproduce parts of it here.

TYPHOID

can be minimized or eliminated entirely if you coöperate with your Health Authorities. Visit your Health Unit today, now! At no expense whatever you can avail yourself of the inoculation which protects you from the dreaded fever. Sterilize, whenever possible. Disinfect your yards, porches, garages. Safeguard the health of your neighbor and you assure the health of your loved ones. Be cheerful, smile; the adage of "Smile and the world smiles with you" still prevails; relax your body, your mind, as you will be certain to when you see the romance of New Orleans:

NEW MOON

with Jeannette McDonald and Nelson Eddy at the cool and quiet air-conditioned Dixie Theatre.

CHIGGERS VS. JITTERS

Although the 1940 season for chiggers will have passed by the time this appears in print, "Credit Lines" cannot withhold until next summer an editorial on the subject that appeared in the *New York State Journal of Medicine*, issue of September 1. We agree with the author that the little creatures are capable of making man forget his woes, but if a choice were left to us to select an even more efficacious creature to banish the jitters we would unhesitatingly select the pestiferous sand flea—the bane of existence to everyone who has spent a vacation on a flea infested beach. But until we can compose an editorial on the subject, we would have you enjoy the following statement re: chiggers—

The Good Companions

Have you a case of "war jitters"? Has the fifth column of worry got you down? Does the shrinking margin of your personal security revive the symptoms of your stomach ulcer, gall-bladder disease, or unbalance your thyroid secretion? Do you wake suddenly in the night asking yourself: Whither are we drifting? Have you a condition bordering on anarchy in your anxiety states? Have you found something new in your neuroses?

Relax. Take a trip to the country. Leave your radio at home. Leave a note for the milkman, discontinue the daily newspaper, and get out into the country, into the fields, especially into fields of tall grass, under the stars! From now into the early fall if you follow this advice, the friendly and harmless chigger will soon divert your mind. He does not transmit any disease according to the U.S.P.H.S., and does not burrow into the skin nor embed his body. He feeds on the upper layers of the skin after this tissue has been dissolved by a substance which he injects into it. This substance is a sovereign remedy for any neurosis which may be turning your life into a pretzel bender's holiday, for it causes the most intense itching. If you can still worry about anything else

while submitting to a mild infestation with chiggers, your time would be better spent in the care-free company of some good alienist.

But assuming that you are organically sound and that, cured of your "war jitters," you wish to rid yourself of your therapeutically good companions, it may be found advantageous to apply a thick lather of soap, let it remain ten minutes or longer, wash, lather again, and rinse thoroughly with clear water. If this is ineffective, try kerosene or 95 per cent alcohol. If you have no kerosene or alcohol you may console yourself with the thought that ". . . after the chigger has become engorged with food, it loosens its hold and falls off."

"SEEING THEM THROUGH"—A FOUR STAR REPORT

Although there are perhaps no other agencies that play such vital parts in our communities as hospitals and health departments, there are comparatively few citizens who have an intimate knowledge of the organization, administration, and services rendered by these agencies. One goes to the hospital for an operation—one goes to the health department (when not to the doctor) for vaccinations. That is about the extent of the average person's knowledge concerning each of these institutions. That both should be better known, that both should be "sold" to the public through publicity is a foregone conclusion.

At last we have come upon a hospital report that does a notable job of acquainting the public with its vast program and its financial needs. We refer to the brochure recently published by the Memorial Hospital for the Treatment of Cancer and Allied Diseases in New York City. Entitled "Seeing Them Through," this brochure reveals the services of the institution as they might be seen through the eyes of a patient. Beginning with the patient's initial interview at the institution's information desk, the reader follows the patient step by step to witness the hospital's services and resources for diagnosis, treatment, research, and teaching. The story is told by means of dramatic photographs with brief, though explicit, captions. The brochure leaves one with the feeling that he has actually been through the institution on a guided tour. And it also leaves him with a keen feeling of appreciation for the institution and the services which it performs.

A health education note is sounded at the outset of the brochure by means of a page devoted to the nature, causes, danger signals, cure, and prevention of cancer.

Health educators or others charged with publicizing health services should see a copy of *Seeing Them Through,* for it is a model of good reportorial work in this field.

BARGAIN X-RAYS AT THE FAIR

When the Queens County Medical Society of New York installed an x-ray demonstration exhibit in the Medicine and Public Health Building at the World's Fair, the exhibit was set up primarily as a display to acquaint the public with the effectiveness of the x-ray as a weapon of preventive medicine. However, before the Fair ended the exhibit grew into a diagnostic center that revealed some rather startling facts about the incidence of tuberculosis.

At this exhibit, the public had an opportunity to have chest radiographs made costing one dollar. Sixteen thousand visitors were tested, and among this group (which was made up of people from all walks of life and from widely separated parts of the country) more than 500 active cases of tuberculosis were detected among persons who were ignorant of their condition. The high rate of tuberculosis found among fair goers has led medical authorities to suspect that the disease may be about three times as widespread as earlier studies indicated.

In addition to the tuberculosis cases detected at the exhibit, the radiographs

also disclosed the fact that various chest abnormalities and deficiencies existed in about 15 per cent of the persons examined. And one visitor learned to his surprise that a carpet tack had long been part and parcel of his chest anatomy!

By offering a bargain radiograph to the Fair visitors, many cases of tuberculosis were discovered in time to prevent further ravages, and no doubt the unsuspecting victims of the disease will long look upon the exhibit of the Queens County Medical Society as a godsend.

HINTS AND HUNCHES

"Your Health" — Realizing that many of the spectators who visited the Medical and Public Health Building at the World's Fair would wish to have a permanent record of the health exhibits displayed there, the American Museum of Health has issued a 95 page booklet containing a complete account of the array of exhibits in the Hall of Man and the Hall of Medical Science. This booklet, entitled "Your Health," contains photographs and detailed descriptions of each display. Health educators will find in this booklet many valuable ideas regarding the use of photographs, panoramas, dioramas, moving figures, pictorial panels, mechanical displays, models, and the like. In short, all the media used by the exhibit specialist can be studied in the pages of this booklet. *Your Health* is available from the American Museum of Health, 30 Rockefeller Plaza, New York, N. Y.

Now that the World's Fair is no longer a part of the contemporary scene, we would like to congratulate everyone who helped to make possible the Medical and Public Health Building. That the time, patience, and study involved in establishing this splendid display were worth while is attested by the attendance, which ranked with that of the more spectacular and more highly publicized attractions at the Fair.

Prescription for Stage Fright— After being subjected to a barrage of political oratory for the past 4 months, our readers are perhaps doubly allergic to anything having to do with the subject of speech making. Nevertheless, a little book, *Stage Fright and What to Do About It* turns up on our desk, and it is such a rollicking, and, at the same time, helpful statement, that we want to bring it to your attention, allergy or no allergy. In this book, stage fright is explained in terms of physiological reactions, and remedies for it are suggested. Health educators or other health officials to whom the word "speech" is synonymous with quaking knees, trembling hands, cold sweat, dry throat, and so on, should rush to the nearest bookseller for this little volume. Aside from the helpful text, the illustrations in themselves are well worth the cost of the book.

Stage Fright and What to Do about It is by Dwight Watkins and Harrison Karr, teachers of public speaking at the University of California. Cost, $1.50. 110 pages. Publishers: Expression Company, Boston, Mass.

Molasses as a Source of Iron— Old fashioned molasses has heretofore been mentioned in print mainly in connection with the poor southerner's so-called starvation diet—corn pone, fat pork, and molasses. Now we learn that it has been subjected to the scrutiny of biochemists at the Massachusetts Institute of Technology who have found that molasses heads the list of iron-containing foods that are useful in the treatment of anemia. In effectiveness, it compares favorably with hemoglobin

producing chemicals that are injected into the blood of anemic people. The poorer and less refined grades of molasses are richer in iron content than the higher grades. Molasses heads the list of foods containing usable iron, beef liver ranks second, and oatmeal third. Spinach, incidentally, is far down the list. (Condensed from the *Scientific Monthly*, Sept., 1940.)

New Radio Series—The American Medical Association, in coöperation with the National Broadcasting System, will inaugurate a new series of broadcasts beginning Wednesday, November 13, at 10:30 P.M., Eastern Standard Time (9:30 C.S.T.; 8:30 M.S.T.; and 7:30 P.S.T.). The new programs will be called "Doctors At Work." According to an official announcement, the series will dramatize the activities of the family physician and various specialists as they meet patients at home, in the hospital, in the clinic, and in the office to solve the mysteries of disease and point the way to better health.

New N.T.A. Movies—The National Tuberculosis Association announces the production of two sound motion pictures entitled "They Do Come Back" and "Goodbye, Mr. Germ." The first of these films was designed to visualize the relationships between rehabilitation and the rest of the tuberculosis program, and to inform the public regarding the need and the nature of rehabilitation service for many of the tuberculous. This theme is carried out by means of a story involving Roy and Julie, young residents of Everytown, who intend to marry, until tuberculosis threatens their lives. The action is narrated by Alois Havrilla, well known radio commentator. "They Do Come Back" runs about 17 minutes and is available in both 16 mm. and 35 mm. prints.

"Goodbye, Mr. Germ" presents the basic facts about tuberculosis. The action takes place in a fantastic laboratory presided over by a queer professor who possesses a radio device that can be hooked up to a microscope. Thus the germ of tuberculosis—Tee Bee—is located and induced to tell the story of his life. This film runs about 14 minutes and is also available in 16 mm. and 35 mm. prints.

Further information about these pictures may be obtained from the National Tuberculosis Association, 1790 Broadway, New York, N. Y., or from state or local tuberculosis associations.

A.M.A. Council Cautions on New Syphilis Treatment—The Council on Pharmacy and Chemistry of the American Medical Association has urged that the medical and public health professions adopt a conservative attitude toward the "five day" treatment for early syphilis. Health educators will recall that this treatment was the subject of widespread publicity in newspapers and magazines shortly after its announcement. Commenting upon the subject, the Council of the A.M.A. states:

> The public health aspects of this new departure in syphilis therapy are tremendous in their possibilities of rapid sterilization of early contagious syphilis. On the other hand, results in syphilis therapy cannot be determined overnight and a system that will give evidence of possible hemorrhagic encephalitis (inflammation of the brain as a result of hemorrhage due to reactions to the drug) in one of apparently every hundred cases treated is by no means a foolproof procedure.

BOOKS AND REPORTS

The Unseen Plague — Chronic Disease—*By Ernst P. Boas. New York: J. J. Augustin,* 1940. 121 pp. Price, $2.00.

One of the unsolved problems in the field of medicine is the care of the chronic sick. Very few communities provide adequate facilities for the satisfactory treatment of this important phase of medical care.

With the conquest of the acute infectious diseases of infancy and childhood and the general improvement of public health measures, we are faced with the growing importance of the degenerative diseases, which have as one of their characteristics the tendency to chronicity. In a recent survey almost one in every five persons was found to have a chronic disease, and this percentage shows every evidence of increasing. At present the handling of this problem is marked by chaos. The first requirement is a responsible agency for thinking out the problems concerned with chronic disease and planning how to meet them.

Dr. Boas, who was formerly Medical Director of the Montefiore Hospital for Chronic Diseases, and is now Chairman of the Committee on Chronic Illness of New York City, has written a comprehensive discussion of the problem of chronic disease.

From the medical standpoint the author points out the necessity for a more optimistic therapeutic attitude. He objects to the concept of "incurable" as applied to chronic diseases, and protests against labelling an institution a "Home for Incurables." A plea is also made for the continuity of supervision of a patient by a single doctor rather than having him seen by a different physician at each visit.

The author divides the chronic sick into three classes:

Class A—Patients requiring medical care for diagnosis and treatment
Class B—Patients requiring chiefly skilled nursing care
Class C—Patients requiring only custodial care

These classes of patients require different provisions for their care.

Emphasis is laid on the interdependence of medical social work and medical care in the treatment of patients with chronic disease. There is a reciprocal relationship between chronic disease and poverty; prolonged illness leads to destitution, and want breeds disease. Illustrative examples are given to show that the trained social worker is indispensable to the physician in the handling of patients with chronic disease.

The final section is devoted to a discussion of a community program for the care of the chronic sick and plans for the construction and operation of a hospital for chronic diseases. In his discussion of a hospital for chronic diseases the author gives specific and detailed suggestions which should prove helpful to anyone concerned with the building or administration of such an institution.

This book should be of value to physicians, health officers and other public officials, social workers, and all concerned with individual and community health and welfare problems.

CHARLES F. WILINSKY

Artificial Pneumothorax—*By Edward N. Packard, M.D., John N. Hayes, M.D., Sidney F. Blanchet, M.D., et al. Philadelphia: Lea & Febiger,* 1940. 300 pp. Price, $4.00.

Drawing largely from their own extensive experience among a fairly large and varied group of patients, 17 Saranac Lake physicians, under the leadership of an editorial committee of the Trudeau Foundation, have written the 19 chapters in this handbook on the practical application of artificial pneumothorax in the treatment of pulmonary tuberculosis.

A major proportion of all patients in tuberculosis hospitals and sanatoria are now receiving artificial pneumothorax treatment. The literature on the subject is extensive. There has been considerable talk about the successes, failures, and vicissitudes of the treatment. A controversy is raging in tuberculosis circles about case fatality rates, with emphasis on the part played by surgical intervention in treating the disease. Varying technics are in use. Thus the handbook is timely.

The volume is an orderly presentation of the case for artificial pneumothorax. There is a studied sequence of subject material. Collateral items are given their proportionate position in the text.

From a historical review in the first chapter the volume proceeds through the selection of cases, technic of operation, complications and accidents occurring during the course of treatment, duration and termination of treatment, and, finally, the results of treatment by artificial pneumothorax. Interspersed are excellent chapters on the physiology of artificial pneumothorax, the value of the x-ray in this form of treatment, a description of the apparatus used, and sections on cardiac disturbances arising in the course of treatment, pathology, and thoracic surgery in relation to artificial pneumothorax.

Although the chapters were written by individual contributors there is a continuity significant of the effort of the editorial board to unify the whole subject without losing the individuality of the various authors' statements.

Especially valuable are the résumés at the conclusion of the chapters and the up-to-date references which have been very carefully selected. Indices of authors and subjects conclude the volume.

Noteworthy is the splendid reproduction of roentgenograms. The typography and format are excellent. This book is a valuable addition to medical literature and is a fine text for teaching purposes as well as an excellent handbook for tuberculosis specialists and general practitioners.

BERNARD S. COLEMAN

Living—*By Thurman B. Rice. Chicago: Scott, Foresman,* 1940. 464 pp. (24 pp. of ills.). Price, $2.25.

"It is the purpose of this text that the student may be helped in the immensely important project of living in a way that will give him the maximum of enjoyment, efficiency and happiness." The book is characterized by several features, not the least important being the author's style of presentation of subject matter in a manner which is likely to hold the reader's interest.

The book of 38 chapters is divided into three parts: Personal Hygiene, Mental Hygiene, and Environmental Hygiene. Each part is preceded by a separately numbered set of pages of effective photographs accompanied by brief captions and descriptive text and printed on paper especially selected for clear reproduction of the illustrations. The pages of these three introductory sections are also apparently used elsewhere, separately bound, as a special bulletin. Effective chapter headings and numerous subheadings together with appropriate illustrations throughout the

book, add to the clarity of presentation.

The author has endeavored to break away from the structural or anatomical method of teaching hygiene—

> The body is so extraordinarily complex that the liberal arts student can gain no adequate notion of the real mechanism of his body in the time that he may reasonably be expected to spend in studying it. Nor is it necessary that he should. . . . For the purposes of hygiene we need a general understanding of the body but hardly need all the academic and technical details, which are after all the province of the technically trained physician or dentist.

Health is defined as

> A state in which by one means or another our hereditary bodies and minds have been brought into such a relation to all these external factors that we are able to live comfortably, efficiently, and reasonably long in the environment about us.

This book contains a wealth of practical information ably presented for the college student. A skillful instructor, aided by this text, should be able to conduct a course filled with lively discussion and lasting values to assist college students "in learning the fine art of living." IRA V. HISCOCK

Chemotherapy and Serum Therapy of Pneumonia—*By Frederick T. Lord, M.D., Elliott S. Robinson, M.D., Ph.D., and Roderick Heffron, M.D. New York: Commonwealth Fund,* 1940. 174 pp. Price, $1.00.

During the decade of 1930–1940 there was a steady and marked increase in our knowledge of the pneumonococcus and the treatment of pneumococcal pneumonia. The entire concept of the disease was changed and incidentally the mortality rate from pneumonia decreased progressively. While these advances have been achieved through the careful work of many investigators in different medical centers, it is more than a coincidence that the Massachusetts Department of Public Health undertook in 1931, with the aid of the Commonwealth Fund, a special comprehensive study of pneumonia. The group of investigators associated in this study made many contributions of a fundamental scientific nature and extended the influence of this increased knowledge in a very practical way to the general practitioner by means of a series of publications in book form beginning in 1936. This is the third of these books.

The book is designed first, to emphasize the fact that the successful control of pneumonia is a community problem and indicates the responsibilities of local health departments in providing adequate laboratory facilities for the accurate diagnosis of pneumonia. A very timely factor is the amount of space and emphasis given the necessity for and the technic of typing of the pneumococcus. There has been a general tendency this past year to consider typing unnecessary since the advent of chemotherapy. The fallacy of such a view is read between the lines in the discussion of the epidemiology of the various types, the prognosis of the different types, and the indications for more intensive treatment of certain types.

The second purpose of the book is to present a summary of the results of both serum therapy and chemotherapy, as reported in the literature in the past few years. Some attempt is also made to compare the results of the two methods of treatment together with a comparison of the hazards incurred with the use of each agent. The most approved technics for the use of serum and drug are presented in detail.

The final chapter gives the suggestion which is prevalent among the large pneumonia clinics that a combination of both drug and serum is probably the treatment of choice in order to secure the lowest mortality rate.

This book condenses in a remarkable way the maze of scientific advances and

presents a concise, up-to-date summary of our knowledge of the pneumococcus, the diagnosis of pneumonia, and the various forms of therapy.

LAWRENCE D. THOMPSON

A College Textbook of Hygiene—*By Dean Franklin Smiley and Adrian Gordon Gould. (3rd ed.) New York: Macmillan,* 1940. 539 pp. Price, $2.50.

The authors have succeeded in bringing this practical textbook up to date and in reorganizing the material in a manner to give more emphasis to the community aspects of the subject. Many community health problems are properly discussed in direct association with personal hygiene. New material includes a discussion of pneumonia, a chapter on air conditioning and ventilation, a consideration of appendicitis, and a chapter on the use of medical services. New and effective illustrations, a useful glossary of technical terms, and a selected bibliography add interest and value to this carefully prepared and well printed volume.

IRA V. HISCOCK

Industrial Health in War—*Industrial Health Research Board (London). New York: British Library of Information (50 Rockefeller Plaza),* 1940. 36 pp. Price, $.25.

This is Emergency Report No. 1, Medical Research Council, giving a summary of research findings capable of immediate application in furtherance of the national effort. The need is rather for application of knowledge previously gained than for new researches—although fresh problems for investigation may present themselves as the war proceeds. Several government departments have already sought advice in conserving man power in promoting the production of war material.

This bulletin aims to express in simple form those results which ought to be applied either at once or as soon as practicable, and covers 20 years' work of the Board. Contents (and number of pages devoted to each): I. Work and Fatigue, 8; II. Light and Vision, 4; III. Heating and Ventilation, 5; IV. Accidents, 3; V. Sickness Absence and Labour Wastage, 7; VI. Conclusion, 1. Each section contains definite recommendations, those under I, II, and III being considered the more immediately practicable. Whole-time medical supervision on the "industrial front" is particularly necessary now, in view of the wide displacement of labor and the unusual number of people having to learn new skills quickly.

EMERY R. HAYHURST

Insect Pests—*By William Clunie Harvey and Harry Hill. London: H. K. Lewis & Co., Ltd. (136 Gower Street, W.C.1),* 1940. 292 pp. Price, $2.75.

This treatise on insect pests seems to have been prepared primarily for the information of health and sanitary officials and for the general information of the people of the British Isles under prevailing emergency conditions. The book is divided into two parts, part one dealing with insect pests, and part two dealing with practices and principles of disinfestation.

The first chapter gives a brief but clear statement about the importance of insects, their anatomy, growth, and transformation, with a general statement on control. Chapters 2, 3, and 4 on the bed bug, flea, and louse, are very well done. The discussions are clear and the importance of the use of sanitation and preventive measures is stressed. Chapter 4 deals briefly with such other pests as cockroaches, crickets, silver-fish, ants, itch mites, psocids, earwigs, wood lice, and house flies.

Mosquitoes are not even mentioned anywhere in the book. With a separate

chapter each, devoted to the flea, louse, and bed bug, it seems strange that a chapter was not also given over to mosquitoes and their importance as disease carriers. This was probably because the book is designed for use solely on the British Isles. It would seem also that more space might very well have been given to the house fly and to the itch mite. With emergency mass movement from the cities to the open country districts, mosquitoes and house flies are sure to play an important part. In fact, the book would have been better balanced if more space had been devoted to part one on insects, and less to part two.

Part two includes a chapter each on Building Construction and Infestation, Gaseous Fumigation, Insect Control and Educational Measures, Legislative Control, Human Toxicology, Disinfestation of Foodstuffs, and Disinfestation of Ships. These chapters deal mostly with things with which the authors are more familiar, and they are very well done. The portions dealing with fumigation have been prepared with especial care. All in all the treatise will prove valuable especially in the hands of medical officers and sanitary inspectors but had the authors more fully covered the important entomological field in part one, it would have been much more valuable to home owners and others all of whom have their insect troubles.

LEONARD HASEMAN

Preliminary Industrial Hygiene Survey of Indiana Industries—*By the Indiana State Board of Health, Bureau of Industrial Hygiene. Indianapolis: Board of Health*, 1939. 162 pp. (paper).

Through joint activities of Governor Townsend, the U. S. Public Health Service, the State Labor Department, and the State Board of Health, a Bureau of Industrial Hygiene was created February 15, 1938, and, under guidance of the Public Health Service, steps were taken to secure basic information regarding the health aspects of employment in Indiana, including welfare data. The Bureau personnel consisted of Louis W. Spolyar, M.D., Chief, John S. Wiley, M.S., Engineer, and Wilma E. Richter, Secretary, who supervised a considerable personnel.

The report summarizes, chiefly through statistical analysis, the findings in regard to workers by sex, occupation, and industry; number, size, and types of plants; welfare facilities for workers; and potential hazardous exposures (the main body of the text), with the corresponding occupations as well as the measures of control found. The idea was to lay the foundation, through non-quantitative determinations, for a constructive development of industrial hygiene services in the state, having general, medical, engineering, and chemical coverage. In total, 2,545 establishments employing 247,817 persons were studied, principally in the extraction of minerals, and mechanical and manufacturing industries, with the addition of laundries and dry-cleaning plants. The survey sample accounted for 75.5 per cent of persons so employed in the state, which is the ninth largest industrial state in the Union.

Short introductory explanatory statements precede the tables, and a general Summary and Recommendations accompany. As with similar surveys in many other states, the scope comprises a sampling survey capable of being projected, by reference to employment figures, to cover the workers of the entire state. Line drawings show the organization and flow sheet of the survey as well as a graphic-pictorial state map locating the principal industrial and rural areas. There are a number of charts and photographs, also valuable Appendices which show the forms and code system used, and a list of 22 references. The volume is a source of

both deciduous and permanent, are described in a manner that will prove most useful to health educators. Moreover, the reader will obtain much valuable information concerning the maintenance of dental health. For example, the fact that missing teeth cause "pyorrhea" and increase the liability to dental decay is convincingly told. The authors explain how x-rays reveal obscure dental abnormalities. Even the fundamental value of healthful foods in achieving dental health is effectively pictured.

Both lay and professional persons will find that this volume will, in less than an hour's reading, present much that is authentic in the dental health field. Particularly is this true because the word—picture technic—has been utilized by a group of dental authorities, headed by Lon W. Morrey, D.D.S., Supervisor of the Bureau of Public Relations of the American Dental Association and Frank Cady, D.D.S., C.P.H., Senior Dental Surgeon, U. S. Public Health Service.

J. M. WISAN

Diabetes: Practical Suggestions for Doctor and Patient—*By Edward L. Bortz. (2nd ed. rev.) New York: Davis,* 1940. 296 pp. Price, $2.50.

In spite of the many small volumes on diabetes there still appears to be room for this one. In the foreword and introduction the prevention of diabetes is stressed. A special chapter on obesity emphasizes this fact. This is the first book for the laity that discards the use of the original unmodified insulin. The author limits treatment to the protamine zinc insulin. Prevention is further emphasized by the recommendation of a thorough semi-annual examination.

This book is written in collaboration with Sister Maude Behrman who wrote the chapter on Diet and Diet Therapy. There are chapters on Diabetes in Children, by Walter Mickael Bortz; Diabetic Surgery, by J. Montgomery Deaver; Dental Care of the Diabetic Patient, by Conrad F. Hellweger, and Care of the Feet, by Arthur Rappaport. A chapter on diabetes and long life is very encouraging because it shows that one who is well taken care of may reach a ripe old age.

The glossary could well be dispensed with, since those who are unfamiliar with technical terms will find it just as difficult to understand the glossary. For instance, the explanation of acetone bodies is as follows: Acetone, Aceto-Acetic Acid and Beta oxy-butric acid. A definition of this sort is not in the least enlightening, and does not clarify medical terms to laymen. Such books should be primarily written for laymen with no technical terms. However, the physician or the allied professional person may still benefit through reading such a book, thereby becoming acquainted with the popular expressions and their application in treating and preventing diabetes. The reviewer recommends this book.

MORRIS ANT

Public Works Engineers' Yearbook 1940—*Chicago: American Public Works Association,* 1940. 338 pp. Price, $3.50.

The 1940 edition of the *Public Works Engineers' Yearbook* presents an excellent over-all picture of current problems in the public works field. The volume comprises the papers presented at the annual Public Works Congress which cover the major activities of this broad field of public activity, supplemented by additional articles especially prepared by outstanding public works authorities. There is also included a report of the business proceedings of the association, and its membership roster. An index adds further to the usefulness of the book.

Organized under functional headings to facilitate reference, this latest edition of the *Yearbook* contains more

than 20 authoritative treatments of such subjects as: "Preparing a Long-Range Program of Public Works," "Improving Public Relations," "The ABC's of Sewage Treatment," "The Federal Works Agency," "Tentative Subdivision Standards," "Channelization and Safety Island Design," "Pedestrian Aids," "A Model Contract for Street Lighting Service," "Low-Cost Pavements," "Street Cleaning Expenditures in 1939," and "The Sanitary Fill Method of Refuse Disposal." In addition, two thoroughgoing open-forum discussions are reported: one on Sewer Maintenance and Reconstruction, and the other on Maintenance and Operation Problems.

Throughout the *Yearbook*, attention is focused on both the administrative and technical aspects of the problems and activities under discussion. Governmental administrators, research bureaus, libraries, and others, as well as public works engineers and officials will find a wealth of information in this important reference document.

ARTHUR P. MILLER

BOOKS RECEIVED

HOLT'S DISEASES OF INFANCY AND CHILDHOOD. By the late L. Emmett Holt and John Howland. Revised by L. Emmett Holt, Jr. and Rustin McIntosh. 11th ed. New York: D. Appleton-Century, 1940. 1421 pp. Price, $10.00.

PUBLIC HEALTH ADMINISTRATION IN THE UNITED STATES. By Wilson G. Smillie. 2d ed. New York: Macmillan, 1940. 553 pp. Price, $3.75.

COMMUNICABLE DISEASES. By Nina D. Gage and John Fitch Landon. 2d ed. Philadelphia: Davis, 1940. 411 pp. Price, $3.50.

TUBERCULOSIS AND GENIUS. By Lewis J. Moorman. Chicago: University of Chicago Press, 1940. 272 pp. Price, $3.00.

MORE YEARS FOR THE ASKING. By Peter J. Steincrohn. New York: D. Appleton-Century Co., 1940. 218 pp. Price, $2.00.

DIABETICS SIMPLIFIED. By L. Jean Bogert and Mame Porter. 2d ed. New York: Macmillan, 1940. 742 pp. Price, $3.00.

CARLOS FINLAY AND YELLOW FEVER. By Carlos Finlay. New York: Oxford, 1940. 249 pp. Price, $4.00.

GROWING OUT OF BABYHOOD. By William S. Sadler and Lena K. Sadler. New York: Funk & Wagnalls, 1940. 350 pp. Price, $2.50.

BORROWED CHILDREN. By Mrs. St. Loe Strachey. New York: Commonwealth Fund, 1940. 149 pp. Price, $.75.

MARRIAGE. By William Lyon Phelps. New York: Dutton, 1940. 56 pp. Price, $1.00.

THE 1940 YEAR BOOK OF PUBLIC HEALTH. Edited by J. C. Geiger. Chicago: Year Book Publishers, 1940. 560 pp. Price, $3.00.

SMOKE-SCREEN. By Samuel B. Pettengill. Distributed by America's Future, Inc., New York, N. Y., 1940. 126 pp. Price, $1.00.

NURSING CARE FOR PATIENTS WITH INFANTILE PARALYSIS. By Jessie L. Stevenson. New York: National Foundation for Infantile Paralysis, 1940. 161 pp. Free.

DEMOCRACY AND EDUCATION IN THE CURRENT CRISIS. By the Faculty of Teachers College. New York: Columbia University, 1940. 13 pp. Single copies free.

ADVANCES IN NEW YORK CITY'S HEALTH. Annual Report of the Department of Health of the City of New York for 1939 with a review of Developments from 1934–1939. New York: Dept. of Health, 1940. 296 pp.

THE NURSING CARE OF PATIENTS WITH INFANTILE PARALYSIS. By Jessie L. Stevenson, R.N. New York (120 Broadway): The National Foundation for Infantile Paralysis, Inc., 1940. 58 pp. Distributed free of charge.

SOURCES OF HEALTH FILMS FOR LAY AUDIENCES. New York (1790 Broadway): National Health Council, 1940. 12 pp. Price, 10¢ (special rates for quantities over 100).

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH.D.

For Your Own Edification—It may be that it is just your hypothalamus cutting up when you have the gripes, the colly wobbles, gooseflesh, or the jitters. At any rate you'll think a lot more rationally about your own pet ailment after you have digested this excellent article.

ALVAREZ, W. C. New Light on the Mechanisms by Which Nervousness Causes Discomfort. J.A.M.A. 115, 12:1010 (Sept. 21), 1940.

Clean vs. Safe Milk—Picturing the slow evolution of the milk sanitation program which has led to safe municipal milk supplies in most communities. The author points to the possibility that some day we shall have a universally adopted well balanced milk inspection service which will prevent the contamination of milk with undesirable bacteria, and not merely assure us of a supply of milk made safe to drink by pasteurization.

BREED, R. S. The Whence and Whither of Milk Sanitation. Canad. Pub. Health J. 31, 9:414 (Sept.), 1940.

Tooth Truth—First in a promising series of authoritative articles on the teeth, this pulls out a few of the well worn molars of misinformation: for instance, the calcium content of enamel does not change after the tooth is erupted, also the diet of the pregnant woman does not materially affect the dental development of the fetus. More later.

DAVIS, W. R. What Is the Truth About Teeth? Pub. Health. Nurs. 32, 9:526 (Sept.), 1940.

Martin Kalikak, et al.—Groundless fear of supposed hereditary taints is a frequent predisposing cause of mental ill-health. We are greatly in need of effective antidotes against the still popular misconceptions about heredity, insists the author of this caustic and entertaining article, which reminds us that for "a person who discerns an occasional nut or two on his family tree, the chances that he will have a nut for a child are, *so far as is now known,* no greater than for the person who doesn't happen to find any nuts on his tree."

DUNLAP, K. Antidotes for Superstitions Concerning Human Heredity. Sci. Month. 51, 3:221 (Sept.), 1940.

Improving Maternal Hygiene—Urging more effective medical participation in the nation-wide maternal health program, the author points out opportunities for bettering the care of mothers and infants.

EMGE, L. A. Present Trends of Socialization of Medicine in Relation to Maternal Welfare. J.A.M.A. 115, 10:819 (Sept. 7), 1940.

Approach to Health Interests—This brief resumé of the fourth annual symposium on health education is so varied and inclusive that it defies competent annotation here. The record should be seen by all, and many will want to read the complete papers which are available in mimeograph form, we are told.

GOLDBERGER, I. H., *et al.* What Shall We Teach? J.A.M.A. 115, 11:940 (Sept. 14), 1940.

All about Mumps—In time of military preparation mumps become a formidable disease, hence the appropriate-

ness of this excellent and comprehensive article.

GORDON, J. E., and HEEREN, R. H. The Epidemiology of Mumps. Am. J. M. Sc. 200, 3:412 (Sept.), 1940.

Age, Sex, Race Distribution of Rheumatic Fever—Largely a problem of childhood and youth, with few cases under 5 or over 40 found, the measure taken to prevent rheumatic fever should be concentrated on youngsters under 20 years of age concludes this interesting study.

HEDLEY, O. F. Rheumatic Heart Disease in Philadelphia Hospitals. Pub. Health Rep. 55, 37:1647 (Sept. 13), 1940.

Vaccinating Dogs against Rabies—Of the vaccinated dogs, a quarter died of rabies after test virus inoculation; whereas slightly more than half the control animals succumbed. It is concluded that vaccine affords *some* protection.

LEACH, C. N., and JOHNSON, H. N. Canine Rabies Vaccination. Am. J. Hyg. 32, 2:46 (Sept.), 1940.

What We Need to Know about Cancer—As an example of public health papers addressed to the educated laity, all of us will profit by reading this excellent discussion of cancer as it is related to our aging population.

PARRAN, T. Cancer and Old Age. Sci. Month. 51, 4:293 (Oct.), 1940.

Stopping Syphilis—Urging a close working arrangement between practising physicians and health departments to the end that all syphilis may be found and treated, the Surgeon General of the U. S. Public Health Service quotes some encouraging statistics: 3½ million blood tests; 12½ million doses of arsphenamine in 1939 are indications of the extent of the attack against the disease the case reports of which indicate the beginnings of successful control. Other papers on the diagnosis and treatment of syphilis complete this excellent symposium.

PARRAN, T. The Public Health Aspects of Syphilis as It Concerns the General Practitioner. New Eng. J. Med. 223, 12:450 (Sept. 19), 1940.

Pigs and Trichinae—Prevention of trichinosis is discussed chiefly from the standpoint of the hog. Prohibition of garbage feeding will eliminate only 40 per cent of the trichinous pigs. Additional control methods are therefore considered.

SCHWARTZ, B. The Trichinosis Situation in the United States. Sci. Month. 51, 3:241 (Sept.), 1940.

Treating Nutritional Deficiencies—One hundred million dollars were spent on vitamin preparations in 1938, so it is estimated, and this is one measure of the effectiveness of advertising. On the other hand a very large part of the population suffers some vitamin deficiency due to ignorance, carelessness, faddishness, or poverty. Some of the many dietary deficiency conditions are considered in a very able discussion.

SEBRELL, W. H. Nutritional Diseases in the United States. J.A.M.A. 115, 10:851 (Sept. 7), 1940.

Are Highway Accidents a Health Problem?—Despite the fact that motor vehicle accidents stand ninth among causes of death (they stand second in the youth-age group), health officials do little about their prevention. Inexperience, weather, condition of the car, highway engineering factors are not much to blame. It is either the nut at the wheel or, more often, the one on the road that is at fault. The mental hygiene administrative problem involved is ably presented in this plea for unification of the various safety educative processes.

SELLING, L. S. The Mental Hygiene Aspect of the Traffic Accident. J.A.M.A. 115, 11:903 (Sept. 14), 1940.

ASSOCIATION NEWS

OFFICERS, 1940–1941

President, W. S. LEATHERS, M.D., Nashville, Tenn.

President-elect, JOHN L. RICE, M.D., New York, N. Y.

Vice-Presidents: ROBERT DEFRIES, M.D., Toronto, Ont., Canada; CARLOS E. FINLAY, M.D., Havana, Cuba; and SELSKAR M. GUNN, New York, N. Y.

Treasurer, LOUIS I. DUBLIN, PH.D., New York, N. Y.

Executive Secretary, REGINALD M. ATWATER, M.D., New York, N. Y.

Chairman of Executive Board, ABEL WOLMAN, DR.ENG., Baltimore, Md.

THE ANNUAL MEETING IN 1941 WILL BE HELD IN ATLANTIC CITY, N. J.

APPLICANTS FOR MEMBERSHIP

The following individuals have applied for membership in the Association. They have requested affiliation with the sections indicated.

Health Officers Section

Alex G. Berger, M.D., 3405 S–Aldrich, Minneapolis, Minn., Health Officer, Minneapolis Health Dept.

Edward J. Braun, M.D., City Hall, Room 22, Cleveland, Ohio, Venereal Disease Administrator, Div. of Health

A. Glenn Evans, M.D., C.P.H., Christiansburg, Va., Montgomery County Health Officer

Clem Ham, M.D., Union County Health Dept., Monroe, N. C., County Health Officer

James A. Loveless, M.D., Davidson County Health Dept., Court House, Nashville, Tenn., Director, Venereal Disease Div.

Samuel J. Ravitch, M.D., Box 574, Quincy, Fla., Director, Gadsden County Health Unit

Marvin M. Satterfield, M.D., Lake County Dept. of Health, Tiptonville, Tenn., Director

Wilfred N. Sisk, M.D., M.P.H., Buncombe County Health Dept., Asheville, N. C., County Health Officer

Laboratory Section

Janet M. Bourn, Ph.D., 1329 W. Grand River Ave., Apt. 81C, East Lansing, Mich., Senior Bacteriologist, State Health Dept.

Frank L. Holden, A.B., 715 Highland Ave., Meadville, Pa., Dairy & Food Inspector and Biochemist, State Board of Health

Aline F. Levy, M.S., 327 Central Park West, New York, N. Y., Student, Delamar Institute of Public Health

Vital Statistics Section

Mae G. Atwood, Box 155, Boise, Ida., Director of Vital Statistics, State Div. of Public Health

Elizabeth M. Canty, 72 Rush St., Somerville, Mass., Statistician, Div. of Vital Statistics, Commonwealth of Massachusetts

Hyman Goldstein, Ph.D., 28 Magnolia Terrace, Albany, N. Y., Asst. Statistician, State Dept. of Health

John Marti, 140 W. Delos St., St. Paul, Minn., Chief Inspector, Bureau of Health

Aristides Fernandez Melendez, M.D., M.P.H., Instituto Finlay, Apartado 157, Habana, Cuba, Field Director, Malaria Commission of Cuba

Josephine Morrissey, Porter Apts., Lansing, Mich., Nosologist, State Dept. of Health

Cathryn Parker, M.S., P. O. Box 24, Santa Fe, N. M., Statistician, State Dept. of Public Health

Eric P. Pfeiffer, M.D., C.P.H., 1027 Des Moines St., Des Moines, Ia., Director of Vital Statistics, State Health Dept.

Gertrude Pienta, 1621 N. Genesee Drive, Lansing, Mich., Statistical Executive, Bureau of Records & Statistics, State Dept. of Health

Kurt Pohlen, Ph.D., 600 West 168th St., New York, N. Y., Research Asst., Delamar Institute of Public Health

Lily Popper, 208 East 18th St., New York, N. Y., Statistician, N. Y. Heart Assn.

LaRue Robinson, 119 South Ynez Ave., Monterey Park, Calif., Deputy Registrar, Bureau of Vital Statistics, Los Angeles City Health Dept.

Walter R. Scott, State Dept. of Health, Trenton, N. J., State Registrar & Chief, Bureau of Vital Statistics

Hi Eastland Steele, A.B., Vital Statistics Div., Bureau of the Census, Washington, D. C., Junior Social Science Analyst (Field Agent)

William G. Weller, 2124 Carlton Ave., Nashville, Tenn., Field Agent, Div. of Vital Statistics, State Dept. of Public Health

Engineering Section

Arnold O. Beckman, Ph.D., 820 Mission St., South Pasadena, Calif., National Technical Laboratories

Thomas D. Laughlin, Box 446, Stambaugh, Mich., Sanitarian, Iron County Health Dept.

Alan C. Love, M.S., 303½ W. 15th St., Austin, Tex., Sanitary Engineer, Austin Travis County Health Unit

Alfred J. Steffen, B.S., State Board of Health, District Office, Elkhorn, Wis., Asst. Sanitary Engineer

T. Ross Williams, Phi Kappa Tau, Pullman, Wash., Student, Washington State College

Industrial Hygiene Section

Lloyd E. Gordon, B.S., 13157 Balfour, Huntington Woods, Mich., Industrial Hygiene Engineer, State Dept. of Health

Max P. Schranck, M.D., 700 Pueblo St., Boise, Ida., Director, Bureau of Industrial Hygiene, State Div. of Health

Frederick J. Vintinner, B.S., Industrial Hygiene Unit, State Board of Health, Concord, N. H., Industrial Hygienist

Food and Nutrition Section

Anna dePlanter Bowes, M.A., South Office Bldg., Room 513, Harrisburg, Pa., Chief, Div. of Nutrition, Bureau of Maternal & Child Health, State Dept. of Health

Anna Leah Carpenter, M.S., Court House, Chattanooga, Tenn., Asst. Supervisor of Elementary Instruction and Nutritionist, Hamilton County

Florence H. Case, B.S., 195 Waterman St., Providence, R. I., Nutritionist, Div. of Maternal & Child Health, State Dept. of Health

Jessie G. Cole, M.A., 270 Quail St., Albany, N. Y., Senior Nutritionist, Child Hygiene Div., State Dept. of Health

Segundino Gallardo Jao, M.D., Institute of Hygiene, Univ. of the Philippines, Manila, Philippine Islands, Instructor in Hygiene

Maternal and Child Health Section

Corinne S. Eddy, M.D., M.S.P.H., Bellevue Hospital, 1st Ave. & 26th St., New York, N. Y., Interne, Children's Medical Service

J. Emit Cox, M.D., Box 1498, Coalinga, Calif., School Physician

Betty Huse, M.D., Children's Bureau, U. S. Dept. of Labor, Washington, D. C., Specialist, Medical Services for Crippled Children

Walter H. Maddux, M.D., 2501 19th St., N., Birmingham, Ala., Medical Director, Slossfield Health Center

Public Health Education Section

Lester Breslow, M.D., 199 Arthur St., S.E., Minneapolis, Minn., Fellow, Student Health Service & Dept. of Preventive Medicine and Public Health, Univ. of Minn.

Pearl V. Collins, 6108 Hartford Ave., Detroit, Mich., Health Investigator, Dept. of Health

Kenneth A. Easlick, D.D.S., School of Dentistry, Univ. of Mich., Ann Arbor, Mich., Adviser to Graduate Students in Public Health Dentistry

Joseph A. Fisher, M.D., 205 Metropolis, Metropolis, Ill., Clinician, Social Hygiene Clinic

Lovic P. Herrington, Ph.D., 290 Congress, New Haven, Conn., Associate Director, John B. Pierce Laboratory of Hygiene

Melita G. Hutzel, Michigan Dept. of Health, Lansing, Mich., Bureau of Education

Thomas A. LaSaine, M.D., 1005 18th Ave., N., Nashville, Tenn., Asst. Professor of Preventive Medicine, Meharry Medical College

Milton Plotz, M.D., 1120 Church Ave., Brooklyn, N. Y., Member of Staff, Long Island College of Medicine

Susan M. Purtell, R.N., B.S., 3525 Cass Ave., Detroit, Mich., Health Educator, Dept. of Health

Jacqueline C. Williams, D.H., 2052 S. High St., Denver, Colo., Asst. Educational Director of Dental Health, Wyoming State Health Dept.

Public Health Nursing Section

Mary A. Burke, R.N., B.S., 151114 Holmur Ave., Detroit, Mich., Supervisor, Div. of Social Hygiene Nursing, Dept. of Health

Dorothy L. Campbell, R.N., B.S., Battle Creek Health Dept., Battle Creek, Mich., Nursing Supervisor

Elizabeth Curtis, R.N., M.A., State House, Room 232, Trenton, N. J., State Advisory Public Health Nurse, State Dept. of Health

Annie Eaglesham, R.N., B.S., C.P.H., 1550 Seward, Detroit, Mich., Supervisor, Grand River Health Center, Dept. of Health

Ella Louise Gilmore, R.N., M.A., 1524 S. Okfusgee, Wewoka, Okla., Asst. County Supervisor, Seminole County Health Unit

Agnes M. Grube, R.N., B.S., City Hall, Neillsville, Wis., District Advisory Nurse, State Board of Health

Ethel R. Jacobs, R.N., B.S., 1516 N. Pennsylvania, Indianapolis, Ind., Consultant Nurse, State Board of Health

Winifred M. Kellogg, R.N., B.S., 814 Louis Ave., Royal Oak, Mich., Educational Director, Detroit Visiting Nurse Assn.

Edna B. Malone, 272 McDonough St., Brooklyn, N. Y., Supervising Nurse, New York City Dept. of Health

Catherine M. McDermott, M.A., Dept. of Health, Peoria, Ill., Director, Div. of Public Health Nursing

Corrine R. Robinson, 1250 East 69th, Chicago, Ill., District Advisory Nurse, State Dept. of Public Health

Corinne N. Sawyer, M.A., 188 West 135th St., New York, N. Y., Supervising Nurse, Dept. of Health

Epidemiology Section

Arthur P. Derby, M.D., Herman Kiefer Hospital, Detroit, Mich., Medical Director, Out-Patient Dept.

William M. Hammon, M.D., Dr.P.H., 36 Pinehurst Way, San Francisco, Calif., Lecturer and Epidemiologist, Hooper Foundation, Univ. of California

Ernest B. Howard, M.D., C.P.H., 30 Wiley Road, Belmont, Mass., Epidemiologist, State Dept. of Public Health

David F. Loewen, M.D., 229 S. Jefferson, Peoria, Ill., Medical Director, Peoria County Tuberculosis Sanitorium Dist.

Benno K. Milmore, M.D., U. S. Marine Hospital, Savannah, Georgia, Asst. Surgeon, U. S. Public Health Service

John R. Paul, M.D., 789 Howard Ave., New Haven, Conn., Professor of Preventive Medicine, Yale Univ. School of Medicine

F. Randolf Philbrook, M.D., M.P.H., 528 N. Main St., Randolph, Mass., Epidemiologist, Div. of Communicable Diseases, State Dept. of Public Health

Ralph F. Sikes, M.D., 3104 Howard Park Ave., Baltimore, Md., Senior Medical Supervisor, Venereal Disease Clinics, City Health Dept.

Ralph R. Sullivan, M.D., 3436 47th Ave. S., Minneapolis, Minn., Asst. Director, Div. of Preventable Diseases, State Dept. of Health

George R. Walton, M.B., D.P.H., City Health Dept., Regina, Saskatchewan, Canada, Medical Officer of Health

Francis J. Weber, M.D., M.P.H., 210 State St., Room 302, New Orleans, La., Asst. Surgeon, Office of Regional Director, U. S. Public Health Service

Unaffiliated

Joseph O. Dean, M.D., U. S. Public Health Service, Washington, D. C., Director of Field Consultant Staff

DECEASED MEMBERS

Dr. J. A. Amyot, Ottawa, Ont., Canada, Elected Member 1900, Elected Fellow 1925, Elected Honorary Fellow 1932

R. G. DeVoist, M.D., Cincinnati, Ohio, Elected Member 1927

Prof. J. G. FitzGerald, M.D., Toronto, Ont., Canada, Elected Member 1912, Elected Fellow 1924

Filip C. Forsbeck, M.D., Cincinnati, Ohio, Elected Member 1932, Elected Fellow 1935

Albini Jeannotte, M.D., D.P.H., Lachine, Que., Canada, Elected Member 1930

S. Adolphus Knopf, M.D., New York, N. Y., Elected Member 1929

Charles F. Mebus, Glenside, Pa., Elected Member 1928

Charles F. Nassau, M.D., Sc.D., LL.D., Philadelphia, Pa., Elected Member 1939

Stuart Pritchard, M.D., Battle Creek, Mich., Elected Member 1931

Frances L. Syrett, Shreveport, La., Elected Member 1936

Hans Zinsser, M.D., Sc.D., Boston, Mass., Elected Member 1920, Elected Fellow 1934

EMPLOYMENT SERVICE

The Association Employment Service seeks to bring to the attention of appointing officers the names of qualified public health personnel and to act as a clearinghouse on employment. This is a service of the Association conducted without expense to employer or employee.

From the registry of persons available, selected announcements are published from time to time. Appointing officers may obtain lists of all registrants on request.

Positions Available

The U. S. Civil Service Commission has announced open competitive examinations to secure bacteriologists for the U. S. Public Health Service. The following grades are included in the examination: associate bacteriologist, $3,200 a year; assistant bacteriologist, $2,600 a year, less a retirement deduction of 3½ per cent. The optional branches are: Brucellosis, Anaerobes, Physiology of Bacteria, Viruses, and Rickettsiae.

Applicants must have completed a 4 year college course including 24 semester hours of study in bacteriology. Postgraduate study or experience in advanced bacteriological work partly in the optional branches chosen is also necessary.

Further information regarding the requirements for these positions and the proper application forms may be obtained from the Secretary of the Board of U. S. Civil Service Examiners at any first- or second-class post office or from the U. S. Civil Service Commission, Washington, D. C. Applications must be filed not later than November 12 if received from states east of Colorado, and not later than November 15, if received from Colorado and states westward.

Positions Wanted

ADMINISTRATIVE

Physician, M.P.H., Harvard, a student of maternal problems, wishes position preferably with teaching opportunities. A461

Physician, M.P.H., Harvard; well experienced in city and rural health administration, will consider appointment as district health officer or in city or state health department. A418

Experienced physician, graduate University of Illinois; M.P.H., Johns Hopkins, 1940; seeks administrative opening suitable to his proven ability. Excellent references. A466

Physician, 32; M.D., 1936; postgraduate course in venereal disease control, experienced as district health officer and in organizing and publicizing syphilis control campaign; now employed in charge of venereal disease clinics in metropolitan health department; seeks venereal disease control post with opportunity to organize or administer program. A437

Physician, M.D., Yale; M.S.P.H., Columbia; also short course for Health Officers, Vanderbilt; good clinical background; 3 years' public health experience; will consider appointment in child health, epidemiology or public health administration. A350

Physician, aged 40; M.D. and Dr.P.H., Yale University; with excellent training in medicine, pediatrics and epidemiology; now specializing in public health education, will consider appointment in health education or administration. A366

Physician, M.D., University of Cincinnati; with postgraduate training in venereal disease control, Johns Hopkins; is available as venereal disease control officer. A363

Physician, aged 40, interested in public health career, seeks full-time position as city or county health officer or school physician; 4 years' experience in New York State. P. O. Box 695, Kingston, N. Y.

HEALTH EDUCATION

Experienced teacher in public health, and author; M.A., Columbia; experienced in teaching public health nursing and carrying field promotion; wishes broad opportunity to train field personnel in extending knowledge and interest to the general public, especially through group education, institutes, exhibits, and rural programs. H400

Young woman, Ph.D., Columbia University; splendid background of experience in health education, will consider position as director of public health education. H294

LABORATORY

Experienced bacteriologist, young man of 33, Sc.B., who for several years has been in charge of state laboratory doing public health and diagnostic bacteriology,

immunology and serology, will consider opening. L427

Experienced woman bacteriologist, Ph.D., University of Illinois, 1937, wishes position in teaching or research. Excellent bibliography and references. L410

SANITARY ENGINEERING

Public health engineering position desired by man with M.S. in Sanitary Engineering from Harvard, and 7 years' experience, including 4 years with state department as assistant engineer. E468

Public health engineer, B.S. in Sanitary Engineering from Massachusetts Institute of Technology; experienced in Massachusetts, Connecticut and Kentucky, seeks position as sanitary or public health engineer with health department. E380

Advertisement

Opportunities Available

WANTED — Young research-minded physician familiar with all phases of medicine, therapeutics, dermatology, health devices for important public health work; some background in pharmacology or chemistry desirable; vicinity $4,600. PH11-15, Medical Bureau (M. Burneice Larson, Director), Palmolive Building, Chicago.

PUBLIC HEALTH PHYSICIAN — To assist director department of preventive medicine and public health; M.S. or Ph.D. degree in Public Health required; experience in teaching public health and preventive medicine helpful; creative ability all-important; initial stipend about $4,000; excellent future. PH11-16, Medical Bureau (M. Burneice Larson, Director), Palmolive Building, Chicago.

PUBLIC HEALTH PHYSICIAN—Staff appointment; university division of hygiene and public health; successful experience in county health administration, skill in epidemiology, advantageous; salary open. PH11-17, Medical Bureau (M. Burneice Larson, Director), Palmolive Building, Chicago.

COUNTY HEALTH PHYSICIANS—(a) Six to 8 experienced public health physicians to serve as commissioners of health in rural counties of South; $3,000, plus $600 travel allowance. (b) Several young Gentile physicians, preferably Southerners, with or without public health training; course of training will be arranged for those without preparation who desire to enter public health work. (c) Young physician for county health appointment offering guarantee of about $3,500 plus private practice privileges; county has population of 12,000, now served by only four physicians; Protestant familiar with conditions in rural south preferred. (d) Several for southeastern state; men under 35 required. PH11-18, Medical Bureau (M. Burneice Larson, Director), Palmolive Building, Chicago.

CITY HEALTH PHYSICIANS—(a) Full-time appointment including all types of public health service except venereal diseases and tuberculosis; no administrative duties involved; central city of 250,000. (b) Staff physician; city health department, town of 40,000; duties largely conducting medical clinics and attendant out-calls; some assisting in other clinics; young married physician under 35 with knowledge of communicable disease preferred. (c) To head newly organized department in city of 10,000; staff includes full-time nurse and full-time sanitary officer; full-time appointment; Southeast. (d) Duties confined largely to general medical practice; young married physician required; Virgin Islands. PH11-19, Medical Bureau (M. Burneice Larson, Director), Palmolive Building, Chicago.

RESEARCH BACTERIOLOGIST—State department of health; man with Ph.D. or D.Sc. degree, Gentile required; principal project will be study of methodology as it pertains to public health bacteriology; $3,000. PH11-20, Medical Bureau (M. Burneice Larson, Director), Palmolive Building, Chicago.

CLINIC NURSE—Public health nurse for clinic appointment in Chicago area; duties purely nursing. PH11-13, Medical Bureau (M. Burneice Larson, Director), Palmolive Building, Chicago.

OUTPATIENT DEPARTMENT SUPERVISOR —Public health nurse to take charge outpatient department; fairly large New York hospital; responsibilities will include taking social histories, follow-up in the home, coördinating medical and nursing services, teaching. PH11-14, Medical Bureau (M. Burneice Larson, Director), Palmolive Building, Chicago.

MATERNAL AND CHILD HEALTH CONSULTANT—Public health nurse with B.S. degree and special preparation in maternity to serve as consultant in division of maternal and child health; duties will include development of maternity demonstration services; more than 50 public health nurses on staff; $200 travel expenses. PH11-1, Medical Bureau (M. Burneice Larson, Director), Palmolive Building, Chicago.

PUBLIC HEALTH NURSING INSTRUCTOR—Experienced public health nurse with B.S., preferably M.S. degree, to serve as major instructor in public health nursing to graduate nurses taking degree and certificate courses in this field; midwestern university. PH11-2, Medical Bureau (M. Burneice Larson, Director), Palmolive Building, Chicago.

PUBLIC HEALTH NURSE—Preferably one with some social service training to serve as medical social worker and public health nurse in children's hospital; large city on shores of Lake Michigan. PH11-3, Medical Bureau (M. Burneice Larson, Director), Palmolive Building, Chicago.

PUBLIC HEALTH NURSE—Certified public health nurse, preferably B.A. degree with public health major, to teach students in generalized tuberculosis program under university auspices. PH11-4, Medical Bureau (M. Burneice Larson, Director), Palmolive Building, Chicago.

PUBLIC HEALTH NURSE—Qualified to serve as executive in county tuberculosis educational program; Illinois. PH11-5, Medical Bureau (M. Burneice Larson, Director), Palmolive Building, Chicago.

PUBLIC HEALTH NURSE—For staff appointment, visiting nurse association; educational program includes Mothercraft classes, Child Health Service, Prenatal Clinics; all work under excellent supervision; public health nurse, under 30, who owns and drives car required. PH11-7, Medical Bureau (M. Burneice Larson, Director), Palmolive Building, Chicago.

PUBLIC HEALTH NURSE—Should be familiar with tuberculosis and school program; executive ability desirable; county health appointment; Indiana. PH11-8, Medical Bureau (M. Burneice Larson, Director), Palmolive Building, Chicago.

PUBLIC HEALTH NURSE—With minimum two quarters in approved public health nursing course; rural public health nursing appointment with state board of health; West. PH11-9, Medical Bureau (M. Burneice Larson, Director), Palmolive Building, Chicago.

PUBLIC HEALTH NURSE—Qualified to assist in city school health program and participate in maternal and child health bedside program; Protestant preferred; county health appointment; $1,500, plus $300 travel allowance; Ohio. PH11-10, Medical Bureau (M. Burneice Larson, Director), Palmolive Building, Chicago.

PUBLIC HEALTH NURSE—Qualified to serve as charge nurse for visiting nurse association in city of 50,000; good background in obstetrics desirable; $140 mileage; must own car; midwest. PH11-12, Medical Bureau (M. Burneice Larson, Director), Palmolive Building, Chicago.

Situations Wanted

INDUSTRIAL HYGIENIST is available; B.S. and medical degree middle western schools; year's graduate training in industrial hygiene at Harvard School of Public Health, for which he received degree of Master of Public Health; has held important industrial appointments; considered outstanding in his specialty; for further information please write M. Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago.

PUBLIC HEALTH PHYSICIAN—B.S. and M.D. degrees, eastern schools; C.P.H., Johns Hopkins School of Hygiene; 5 years chief epidemiologist State Department of Health; for further information, please write M. Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago.

PUBLIC HEALTH NURSE—Graduate of university hospital training school; will receive B.S. degree in public health nursing in December; will go anywhere; for further information, please write M. Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago.

PUBLIC HEALTH NURSE—B.S. and M.S. degrees in administration in public health nursing, eastern university; active in public health administration for many years; keenly interested in social problems; now educational director visiting nurse association; for further information please write M. Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago.

NEWS FROM THE FIELD

PUBLIC HEALTH AND NATIONAL DEFENSE

PRESIDENT ROOSEVELT has named a committee to coöperate with the National Defense Advisory Commission on all phases of public health to strengthen the nation for any emergency.

A board of five men has been created under the Chairmanship of Irvin Abell, M.D., Louisville, Ky., "to advise the council of national defense regarding the health and medical aspects of the national defense, and to coördinate health and medical activities affecting national defense." Other members of the Board include: Lewis H. Weed, M.D., Chairman of the Division of Medical Sciences of the National Research Council; Rear Admiral Ross T. McIntire, Surgeon General of the Navy and White House physician; Major General James C. Magee, Surgeon General of the U. S. Army, and Thomas Parran, M.D., Surgeon General of the U. S. Public Health Service.

The press reported that Surgeon General Magee had indicated that 16,000 additional physicians would be needed by the armed forces to handle a total of 900,000 prospective conscripts yearly. These would be recruited from about 180,000 physicians in the United States. He stated at that time that every effort would be made to see that there was a proper spread of physicians and nurses and that the Army would not upset the routine of civilian health services because of the emergency.

NEW INFLUENZA VACCINE

THE public press, on October 22, carried an announcement that the Rockefeller Foundation is preparing to make available large quantities of its newly discovered vaccine against influenza to combat the possibility of a war-bred epidemic in Europe. An indication that the British desire to try the vaccine has been received and a million doses are being prepared for a test if an epidemic should appear, but no shipment of vaccine is contemplated until a definite project has been approved.

The announcement indicated that Dr. Frank L. Horsfall and Dr. H. Lennette, of the Foundation's International Health Division, had tried the vaccine on more than a hundred volunteers from which it had been determined that the vaccine raises the number of protective antibodies against influenza more than any other vaccine. It is stated that this vaccine was discovered by accident, the workers coming upon it unexpectedly in a fight to save the lives of about 100 experimental ferrets from an epidemic of distemper. In order to prevent the entire loss of the experimental ferrets on which investigations of influenza had been carried out, a vaccine was prepared from the lung tissues of ferrets dying from distemper and with this vaccine the epizoötic was controlled. Thereafter it was discovered that a combination of the distemper virus and of the influenza virus immunized the animals against influenza. The new virus combines the influenza and distemper viruses which are grown on chicken embryos.

NURSES FOR NATIONAL DEFENSE

IT was announced recently, by Mary Beard, National Director of the American Red Cross Nursing Service, that 4,000 Red Cross nurses would be called to active duty before July, 1941.

She stated that, in addition to the nurses for clinical responsibility, the national defense would also require

thousands of public health nurses, and that the Red Cross is encouraging enrollment of all active and inactive nurses at this time. All nurses selected, according to Miss Beard, will be under 35 years of age, graduates of an approved school of nursing, registered as nurses, American citizens, and of single, widowed or divorced status.

NEW YORK WELFARE COUNCIL HEALTH UNIT ENLARGED

ENLARGEMENT of the health division of the Welfare Council of New York City, with Mary C. Jarrett as Secretary, and Harold W. McCormick as Assistant Secretary, was announced recently.

Miss Jarrett has been secretary of the council's standing committee on chronic illness. Mr. McCormick was secretary to President James Marshall, of the Board of Education.

PUERTO RICAN TERRITORIAL COMMITTEE ON MEDICAL PREPAREDNESS

IN Puerto Rico, the Territorial Committee on Medical Preparedness has been organized under the Chairmanship of Dr. O. Costa-Mandry, who is Director of the Public Health Laboratory Division in the Territorial Department of Health and President of the Puerto Rico Medical Association. Dr. E. Garrido-Morales, the Puerto Rican Commissioner of Health, San Juan, is also a member of the committee.

UNIVERSITY OF NORTH CAROLINA SCHOOL OF PUBLIC HEALTH

THE University of North Carolina, Chapel Hill, has announced that the former Division of Public Health in the University has now been made the School of Public Health, and that Dr. Milton J. Rosenau is the new Dean. Dr. Rosenau has been Director of the Division since it was established in 1936.

BLOOD TESTS FOR SYPHILIS

FULL coöperation by state and local health authorities is urged by Surgeon General Thomas Parran, of the U. S. Public Health Service, in plans by the Selective Service Board to give blood tests for syphilis to all men called for physical examinations before local boards.

In a recent letter to State Health Officers, Dr. Parran pointed out that Selective Service medical regulations require that the tests be given by physicians of local boards as a routine part of the physical examination. "All of the facilities available to state health departments and to local health departments should be utilized to bring under treatment as promptly as possible all men who are found to be infected with syphilis," Dr. Parran stated. He also stressed the importance of tracing the sources of infection on cases of syphilis found. Special forms have been developed by the Public Health Service to aid in follow-up work and to provide comparable data on the extent of the problem in this selected group.

State health departments will perform the necessary laboratory work. Federal venereal disease control funds will be available for supplies and additional personnel.

Prior to induction, a second blood test will be required on every registrant whose first test was reported positive. No diagnosis of syphilis will be made simply on the basis of a single positive blood test.

MORE CANCER CURES

AT its meeting in Chicago, on October 20, the American College of Surgeons announced that there are 36,078 5 year "cancer cures" in the United States—persons who had cancer and who, five years after treatment, are free of the disease.

The number is an increase of 6,000

over the total counted 3 years ago when the College took its last formal cancer census.

IDAHO PUBLIC HEALTH ASSOCIATION ELECTS OFFICERS

THE following officers were elected and installed at the first annual meeting of the Idaho Public Health Association, held at Twin Falls, Ida., September 9–10:

President—W. P. Hughes, Lewiston
Vice President—Dr. A. M. Newton, Pocatello
2nd Vice President—Mrs. R. L. Brainard, Wardner
3rd Vice President—Mrs. E. T. Taylor, Coeur d'Alene
4th Vice President—A. H. Christiansen, Boise
5th Vice President—Mrs. Emma Clouchek, Twin Falls
Secretary—H. C. Clare, Boise
Treasurer—Lucy Higgins, Boise
Board of Directors—Mrs. Kathryn McCabe, Boise; L. J. Peterson, Boise; Frank A. Rhea, Boise.

MICHIGAN SCHOOL HEALTH ASSOCIATION

THE following officers were elected at the meeting of the Michigan School Health Association held in Grand Rapids, October 10–12:

President—Dr. V. K. Volk, Saginaw
Vice-President—Dr. K. E. Gibson, Detroit
Secretary—Dr. D. VanderSlice, Ann Arbor
Treasurer—Dr. Sue H. Thompson, West Branch

AUTOCLAVE REPAIRS WARNING

IT is reported that four laboratories in New Jersey have been visited by irresponsible agents who remove autoclaves for the purpose of lining them with monel metal and for general repairs, stating that the cost would be about $20. After the autoclaves are torn down they report that the bill will be higher and then return with a bill for several hundred dollars. The victims have asked that other laboratories be warned.

EPIDEMIOLOGISTS-IN-TRAINING

NINE epidemiologists - in - training have gone from the New York State Department of Health to schools of public health, together with 1 member of a city health department.

To the Johns Hopkins School of Hygiene and Public Health will go: Dr. Anne Magdalen Bahlke, from Geneva; Dr. Berwin F. Mattison, from Syracuse; Dr. Arthur M. Rubin, from Saranac Lake; Dr. Terry S. Montague, from Gouverneur; and Dr. John Alden Degen, from Middletown.

To the Harvard School of Public Health will go: Dr. David H. Ross, from Middletown, and Dr. Earle H. Harris, from Rochester.

Dr. Theodore S. Drachman from Albany, Dr. Louis Platt from Rochester, and Dr. Howard H. Volan from Syracuse are going to attend the DeLamar School of Public Health, Columbia University.

CANADIAN DEATHS

THE recent Annual Report of the Canadian Public Health Association records the death of 44 members of the association for the year ending June 30, 1940.

Among this list is an extraordinary number of well known names, including: Dr. J. A. Amyot, formerly Deputy Minister of Pensions and National Health, Ottawa; Dr. A. J. Douglas, formerly Medical Officer of Health, Winnipeg; Dr. J. G. FitzGerald, Director, School of Hygiene and Connaught Laboratories, University of Toronto; Dr. Pio H. Laporte, Minister of Health and Labour, Province of New Brunswick; Dr. J. W. McIntosh, formerly Senior Medical Health Officer, Vancouver; Dr. James Roberts, Medical Officer of Health, Hamilton, Ontario; and Dr. H. E. Young, Provincial Health Officer, Victoria, B. C.

SYMPOSIUM ON INDUSTRIAL HEALTH

The Saginaw County Medical Society, Saginaw, Mich., is sponsoring an all day Symposium on Industrial Health, under the supervision of the Industrial Health Committee, to be held on November 12, 1940.

There will be morning sessions devoted to the relations of the manufacturer and industrial health, a luncheon meeting devoted to the relationships of industrial health and national defense; afternoon sessions devoted to personnel problems in industrial health, and an evening dinner meeting concerned with a primarily medical industrial problem.

RHEUMATIC FEVER STUDY

THE Chicago Heart Association, Inc., has received from the Clara A. Abbott Trust a gift of $27,000 to be added to the Memorial Fund founded in memory of Morris Fishbein, Jr. The money is to be used either by itself or with other funds of the society for the study and treatment of diseases of the heart and the circulation. A fellowship is to be established in a hospital or medical school in Chicago, which will be devoted primarily to the study of the cause and treatment of rheumatic fever. The Memorial Fund of the Chicago Heart Association was established in 1929 by Dr. and Mrs. Morris Fishbein at the time of the death of their son from rheumatic fever.

CONSERVATION OF MAN POWER IN THE DEFENSE INDUSTRIES

A NATIONAL COMMITTEE for the Conservation of Man Power in Defense Industries has been organized to execute a new plan of coordinating accident prevention efforts throughout the country. The membership includes safety experts from private industry, executives from the national and local safety councils, labor representatives, and state officials. Appointed as special agents of the U. S. Department of Labor, the 24 members of the committee are serving entirely on a voluntary basis. The new plan to safeguard the productive man power of the nation in the emergency defense program was announced by the Department of Labor following a recent meeting of various interested groups. It aims to bring to industries operating on government contracts, particularly the smaller industrial units, the experience of the country's largest and best managed industries in accident control. According to *National Safety News,* the plan recognizes the basic necessity of state and local health regulations but emphasizes the need for safety education, training, and stimulation extending beyond the scope of laws, rules, and codes. The program will be carried out with the assistance of regional representatives and district and local contact men. The contact man assigned will volunteer to assist the management of the industrial plant in organizing a safety program and to make an appraisal of physical hazards and submit information on their correction. He will act as a continuous adviser to the management for the duration of the contract and beyond, if desired by the management.

The division of labor standards, U. S. Department of Labor, is acting as the clearing house for all activities in connection with the plan. The technical staff of the division's safety and health section is responsible for the preparation, under the direction of the national committee, of procedures, forms, and promotional, educational, and technical material. The safety and health section will keep records of accident experience in the defense industries and report its conclusions to the national committee.

PERSONALS

Central States

MARGARET ARNSTEIN, R.N., C.P.H.,* has resigned from the staff of the University of Minnesota, Minneapolis,

to accept a reappointment as a Consultant Public Health Nurse in Education with the New York State Department of Health. Miss Arnstein has been assigned to the New York District and will be responsible for the three county health departments in the New York area, Westchester, Nassau, and Suffolk Counties.

JOHN W. FERREE, M.D.,† of Indianapolis, Ind., was appointed, October 7, Director of the Indiana State Board of Health. Dr. Ferree, formerly Director of the Bureau of Local Health Administration of the State Health Board, succeeds VERNE K. HARVEY, M.D.,† who has accepted the post of Chief Medical Officer of the U. S. Civil Service Board of Examiners, Washington, D. C.

CLIFTON F. HALL, M.D.,† of Big Rapids, Mich., has been appointed Director of the Mecosta-Osceola Health Department; he has been Acting Director since October, 1939.

VERNE K. HARVEY, M.D.,† Director of the Indiana State Board of Health, Indianapolis, Ind., has resigned to accept a post as Chief Medical Officer of the U. S. Civil Service Board of Commissioners, at Washington, D. C. Dr. Harvey has been Director of the State Board of Health since 1933. He was first appointed by Paul V. McNutt, then Governor, and reappointed in 1937 by Governor Townsend. The position he assumes with the Civil Service Board is a newly created post made necessary by increased demand for civil service personnel in various government departments in connection with the rapidly expanding national defense program.

CHESTER A. HICKS, M.D.,† formerly of Ann Arbor, Mich., has been elected Commissioner of Health for the district composed of Bleckley and Dodge Counties, Georgia, with headquarters in Eastman.

ERWIN F. HOFFMAN, M.D.,† of Iron Mountain, Mich., has resigned as Health Officer of Dickinson County, to join the Florida State Department of Health, Jacksonville.

EDWARD F. KRUMBIEGEL, M.D.,† former Director of the Bureau of Communicable Disease and School Hygiene of the Health Department of Milwaukee, Wis., has been appointed Commissioner of Health of Milwaukee.

ROELOF LANTING, M.D.,† who during a leave of absence as Director of the Delta County Health Department, Escanaba, Mich., has been studying in the Graduate School of Public Health and Hygiene, University of Michigan, Ann Arbor, has been appointed Director of Health District No. 7, with headquarters in Gladwin. FRED O. TONNEY, M.D.,† formerly of Chicago, Acting Director of the Delta County unit, Escanaba, will remain there until a new director has been named before accepting a recent appointment to the staff of the Michigan State Department of Health, at Lansing.

EDWIN L. MCQUADE, M.D.,† of Lansing, Mich., has resigned from the Michigan State Department of Health, where he was in charge of the typhoid control program in the Bureau of Epidemiology.

WILLIAM D. STOVALL, M.D.,* of Madison, Wis., Director of the State Laboratory of Hygiene for 25 years, was recently awarded the 1940 medal of the Wisconsin State Medical Society. At the 99th Annual Meeting of the Society in Milwaukee, Dr. Stovall received the recognition "for outstanding service to the science of medicine, his fellow physicians, and the public." Dr. Stovall is Wisconsin State Chairman of the American Society for the Control of Cancer, has

* Fellow A.P.H.A.
† Member A.P.H.A.

been active in his County and State Medical Society, and recently served for two years as Acting Superintendent of the Wisconsin General Hospital in Madison.

Eastern States

HOMER FOLKS, LL.D.,* Secretary of the New York State Charities Aid Association, New York, N. Y., has been awarded a Roosevelt Distinguished Service Medal for 1940. This award, established by the Roosevelt Memorial Association in 1923, was awarded to Mr. Folks "for the advancement of social justice" as one of the fields associated with Theodore Roosevelt's career. For almost 50 years Mr. Folks has been a public welfare worker, especially in the field of public health and the protection and care of children. He is Vice-Chairman of the New York State Public Health Council.

PAUL D. GUERNSEY, M.S.P.H.,† of New York, N. Y., has been appointed Health Education Secretary on the staff of the Buffalo Tuberculosis Association of Erie County, at Buffalo, N. Y.

DR. FRANK J. HILL, of Waterbury, Conn., was recently named Health Officer of the Mason-Manistee Health Unit, in Michigan.

DR. JOSEPH H. KLER, who has been University Physician at Rutgers University, New Brunswick, N. J., has resigned, but will continue a relationship as associate head of the Department. His successor is DR. WILLIAM RUSSELL GREENWOOD, who has been Assistant Physician and who is now University Physician and head of the Department of Student Health.

ROY M. SEIDEMAN, M.D., DR.P.H., of Boston, Mass., has been appointed Assistant Commissioner in charge of Maternal, Infant and Child Health of the Cattaraugus County Department of Health, Olean, N. Y.

LLOYD R. SETTER, PH.D.,† Assistant Professor of Sanitary Chemistry and Biology, in the New York University College of Engineering, is taking over a new position as Principal Sanitary Chemist with the New York City Department of Public Works.

DR. CHARLES B. SYLVESTER, of Portland, Me., has been elected President of the Maine Public Health Association at its 29th annual meeting held in Kennebunk, Me., July 11.

Southern States

DR. OSWALD N. ANDERSON, Assistant Superintendent of Barnes Hospital, St. Louis, Mo., and previously connected with the Council on Medical Education and Hospitals, American Medical Association, Chicago, has been appointed General Director of the School of Hygiene and Physical Education at Stanford University, Palo Alto, Calif., as Associate Professor.

JOHN W. E. H. BECK, M.D.,† of Austin, Tex., Director of Local Health Services with the State Board of Health for the past 3 years and previously Director of Maternal and Child Welfare for 1 year, has resigned to return to private practice in DeKalb.

FRANK P. BERTRAM, D.D.S.,† of Oklahoma City, Director of the Oklahoma State Dental Program, will attend the Harvard University School of Public Health during the school year 1940–1941.

LOUIS A. BREFFEILH, M.D., of Shreveport, La., has succeeded RALPH H. ALLEN, M.D.,† of Ruston, La., as Director of the Lincoln Parish Health Unit.

HUGH J. BICKERSTAFF, M.D.,† of Atlanta, Ga., has resigned as Associate Director in the Division of Maternal

* Fellow A.P.H.A.
† Member A.P.H.A.

and Child Health, Georgia State Department of Health, to become Associate Professor in Public Health Administration at the Johns Hopkins School of Hygiene and Public Health, Baltimore, Md.

DR. JAMES M. CORAM, of St. Mary's W. Va., has been appointed Acting Health Officer of Raleigh County, succeeding WILLIAM W. HUME, M.D.,† who has resigned.

LELAND H. DAME, M.D.,† of West Palm Beach, Fla., has been appointed Director of the Hamilton County Health Unit.

DR. BERTHOLD H. ESTESS, of New Braunfels, Tex., is in charge of a new health unit for Jasper and Newton Counties, with headquarters at Jasper.

DR. EARLE C. GATES, of Bristol, Va., has been appointed Health Officer of a new health unit in Chesterfield County.

DR. OTIS F. GAY, of Ashland, Ala., head of the Health Unit in Clay County, has been appointed to a similar position in Butler County, succeeding DR. WILLIAM M. ASKEW, JR., of Greenville, who resigned recently.

JOHN M. HOOPER, M.D.,† of Austin, Tex., recently succeeded DR. JAMES J. CROLEY as Director of the McKinney-Collin County Health Unit.

DR. YEADON M. HYER, of Chester, S. C., has been appointed Health Officer for Hampton and Allendale Counties.

DR. WILLIAM H. LACEY, of Blackville, S. C., has been appointed Health Officer of Georgetown County, to succeed GEORGE S. T. PEEPLES, M.D.,† now with the State Department of Health.

KATHERINE F. LENROOT,* Chief of the Children's Bureau of the U. S. Department of Labor, Washington, D. C., was awarded *The Parents' Magazine* medal for achievement in child health and protection on September 23, in recognition of her 26 years of service in the Bureau, the organization of the White House Conference on Children in a Democracy, and many other services to child health.

ROBERT L. LOFKIN, M.D., recently Health Officer of Pike County, Ky., has been appointed Health Officer of a new unit in Harrison County, with headquarters in Cynthiana, Ky.

MARGERY J. LORD, M.D.,† of Asheville, N. C., has been appointed City Health Officer. Dr. Lord is planning to take a course in public health at the University of North Carolina.

DR. ALBERT L. MALL, of Cleveland, Tenn., has resigned as head of the Bradley County Health Unit, and has been succeeded by HARRY H. HUDSON, M.D., of Dyersburg.

DR. ROBERT BRUCE MALLETT, of Baltimore, Md., has been appointed Health Officer of Orange County, Va., opened July 1.

LEO H. MYNES, M.D.,* Medical Director of the Kanawha County Schools, Charleston, W. Va., was elected President of the West Virginia Tuberculosis and Health Association, at its annual meeting in Clarksburg, on September 20.

DEATHS

DR. ROBERT E. CHADDOCK,* of New York, N. Y., died October 21. He was Professor of Statistics at Columbia University for 31 years.

GEORGE G. EARL,* of New Orleans, La., died September 16, at the age of 77. For 31 years he was General Superintendent and Chief Engineer of the Sewerage and Water Board of New Orleans, and later served as Consulting Engineer for that Board.

* Fellow A.P.H.A.
† Member A.P.H.A.

CONFERENCES AND DATES

American Camping Association — 18th Annual Convention. Wardman-Park Hotel, Washington, D. C. February 13–15, 1941.

American College of Physicians—25th Annual Session. Statler Hotel, Boston, Mass. April 21–25, 1941.

American Association for the Advancement of Science. Philadelphia, Pa. December 27–January 2.

American Education Week (20th annual observance), November 10–16. Theme: "Education for the Common Defense."

American Library Association. Midwinter Conference, Chicago, Ill., December 27–30. Annual Meeting, Boston, Mass., June 19–25, 1941.

American Public Welfare Association. Round Table and Annual Meeting. Washington, D. C. December.

American Society for Public Administration. Chicago, Ill. December 29–30.

American Society of Heating and Ventilating Engineers—Summer Meeting. San Francisco, Calif. June 16–20, 1941.

American Standards Association. New York, N. Y. December 11.

American Student Health Association —Annual Meeting. University of Michigan, Ann Arbor, Mich. December 27–28.

American Water Works Association:
Four States Section—Hotel Du Pont, Wilmington, Del. November 7–8.
Minnesota Section—St. Paul Hotel, St. Paul, Minn. November 7–8.
Missouri Valley Section—Hotel Fontenelle, Omaha, Nebr. November 13–15.

Canadian Public Health Association—Laboratory Section. Ninth Annual Christmas Meeting. Royal York Hotel, Toronto, Ont. December 16–17.

Conference on Current Governmental Problems. Massachusetts State College, Amherst, Mass. November 15–16.

Florida Public Health Association. Tampa, Fla. December 5–7.

Heating, Piping & Air Conditioning Contractors National Association. San Francisco, Calif. June 16–20, 1941.

Industrial Health and Safety Symposium — Sponsored by Saginaw County Medical Society. Bancroft Hotel, Saginaw, Mich. November 12.

National Association of Bedding and Upholstery Law Enforcement Officials —Annual Meeting. New York, N. Y. November 19–21.

National Chemical Exposition—sponsored by the Chicago Section of the American Chemical Society. Stevens Hotel, Chicago, Ill. December 11–15.

National Committee for Mental Hygiene—31st Annual Meeting and Luncheon. Roosevelt Hotel, New York, N. Y. November 14.

National Council of State Public Assistance and Welfare Administrators. Washington, D. C. December.

New Jersey Health and Sanitary Association, Inc. 66th Annual Meeting. Hotel Berkeley-Carteret, Asbury Park, N. J. November 15–16.

New York State Association of Public Health Laboratories—Mid-year Meeting. Division of Laboratories and Research, New York State Department of Health, Albany, N. Y. November 1.

Pacific Heating and Air Conditioning Exposition. Exposition Auditorium, Civic Center, San Francisco, Calif. June 16–20, 1941.

Post-Graduate Institute for Negro Physicians. Howard University, College of Medicine, Washington, D. C. November 3–6.

Public Health Association of New York

City—First Fall Meeting. Russell Sage Foundation Auditorium, 130 East 22nd Street, New York, N. Y. November 19 (8:00 P.M.).

Society of American Bacteriologists. St. Louis, Mo. December.

Southern Branch, American Public Health Association — Meeting with the Southern Medical Association. Louisville, Ky. November 12–15.

University of Chicago, Chicago, Ill. Fiftieth Anniversary Year: October 1, 1940–September, 1941.

West Virginia Public Health Association. Morgan Hotel, Morgantown, W. Va. October 31, November 1–2.

Western Branch, American Public Health Association — 12th Annual Meeting. San Diego, Calif. May 26–30, 1941.

Foreign

International College of Surgeons. Mexico City, Mexico. August 10–13, 1941.

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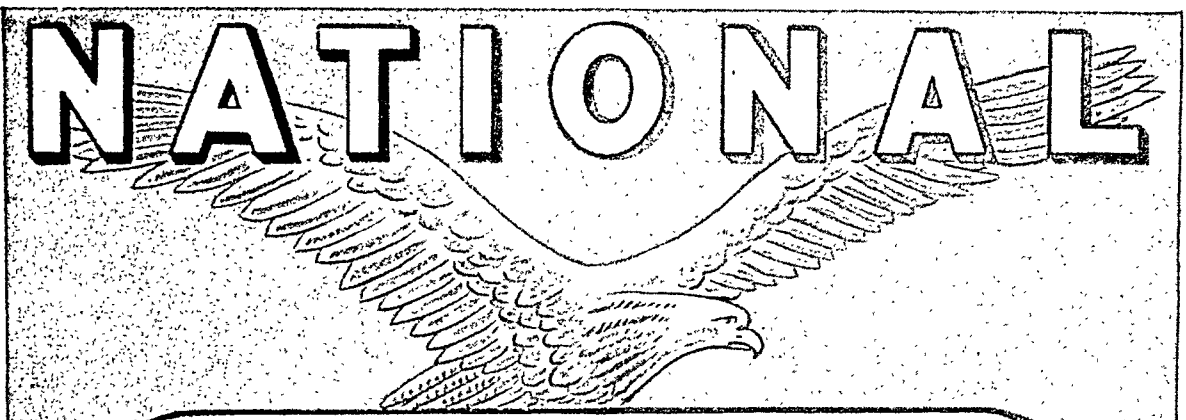
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* Toomey, J. A.: Pa. Med. Jnl., 43: 769 (Mar.) 1940.

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Health Aspects of Land-Fills

With Special Reference to Recent Experiences in New York City*

JOHN L. RICE, M.D., F.A.P.H.A., AND
SOL PINCUS, C.E., F.A.P.H.A.

Commissioner of Health; and Deputy Commissioner of Health, New York, N. Y.

THE prompt, scientific, and economic disposal of municipal refuse has for years occupied the attention of large municipalities here and abroad. As far as New York City is concerned, we need only mention a few of the specific attempts made during the past thirty years, all with varying degrees of failure to appreciate the great difficulty of the problem. Some of you may be familiar with the endlessly smoking Rikers Island dump, the smouldering Corona dump, the Barren Island reduction plant—spreading odors for miles in the neighborhood, the ill-fated Staten Island reduction plant—closed after a year's operation, and, finally, the disposal of waste by dumping at sea, which was discontinued 6 years ago by order of the United States Supreme Court.

For the past 3½ years, mainly two methods have been used by the city for the disposal of its refuse and garbage: (1) destruction by incineration, and (2) the sanitary land-fills. It is with the second and newer of the two disposal methods that this present paper will largely deal.

Before discussing the technic and health aspects of refuse and garbage disposal by land-fills, we want to point out that a recent, serious issue developed in New York City around the problem of garbage disposal by this method. The matter became a prominent health controversy before the city, challenging the various city departments and reaching up to Grand Jury indictments of the Commissioner of Health and the Commissioner of Sanitation. The question of the responsibility of the health officer and the powers of the Board of Health became issues involved in the situation.

Before the days of Koch and Pasteur, health officers and health departments devoted their time largely to environmental sanitation—the control of the smelly pig sty, the smoking dump, and the squalid tenement. These were matters of first importance, closely seconded by the damp cellar and the castoff wearing apparel.

* Read before the Engineering Section of the American Public Health Association at the Sixty-ninth Annual Meeting in Detroit, Mich., October 11, 1940.

When, in 1877, Koch and Pasteur revolutionized our ideas on disease, our profession began to give its attention, and devote its activities to those things for which there was a scientific basis or experimental evidence. Gradually the health official turned away from many of the earlier fields because a relationship to health in its scientific sense could not be demonstrated. This was the period when bacteriology held sway and the effectiveness of our service to the people was strengthened and deepened.

In the last decade or so the pendulum has swung back again to include a much broader sphere of usefulness, resulting in a renewed interest in some of the traditional functions of the health departments. Housing, recreation, noise, and refuse disposal are related to health whether it can be scientifically proved or not. The public is right in demanding in addition to disease control, decent living conditions and opportunities for recreation. The program and responsibilities of health departments must be broadened.

With the expansion of health activities, cities and towns have come not only to have health departments, but also water departments, departments of public works, sewer departments, departments of sanitation, etc. In New York City the last mentioned has under its jurisdiction the collection and disposal of waste material, street cleaning, and snow removal. But, while such matters as water, waste disposal, and street cleaning are under the direct control of other municipal departments, the department of health is not relieved of the responsibility of supervising the public water supply, the disposal of sewage, or the collection of refuse—for the job of the health department and the body of laws which govern public health matters embrace all problems which pertain to the public health. The Board of Health, in the presence of great and imminent peril to the public health, can take such measures as are necessary for the preservation of the health of the people.

It is natural that the public should be sensitive to objectionable odors, excessive noise, dense smoke, unsightly and carelessly operated garbage dumps, and similar conditions. We will also agree that the public has a right to express itself plainly on such matters. Remedies against them are provided by our laws, and our Sanitary Codes make special provision for relief from "public nuisances." But the way to determine the existence of a nuisance is not by immediate appeal to drastic police power or court action, and, still less, by taking it onto the football field of politics; but through fact finding, group thinking, and scientific judgment. In our own case in New York City a group of citizens tried to remedy an alleged public nuisance by securing an indictment of two city commissioners—an unusual procedure. And yet, as a matter of fact, for the first time in New York City, a very serious effort was being attempted by city officials to develop a program of disposal of rubbish and garbage under sanitary, scientific control, that would be truly economical —cheaper than incineration.

The land-fill operations for disposal of these wastes involve an entirely different procedure from that used in the old refuse or garbage dumps that have been the community receptacles for its unwanted materials.

These modern land-fills are operated on an entirely different plane, with equipment of the latest design, and supervised by skilled and experienced men, with a better type of workman than has previously been used in such operations. The activity is no longer carried out by the dregs on the city pay roll and supervised by political drones, but is a serious business done by workmen who realize that

they have a responsible job and are expected to get real results.

In guiding and controlling the detailed operations, the facts of sanitary science, as far as available, are used, and where such scientific information is not available, experimental and research work is carried on. The Commissioner of Sanitation has appointed an advisory group of sanitary scientists and public health officials, and an extensive WPA research project on land-fills has been sponsored by that department. This project is under the supervision of the Division of Sanitary Engineering of New York University. As many of you may recall, a preliminary report on the work of this project was presented by the late Professor Carpenter and Professor Setter, at our Pittsburgh meeting.[1]

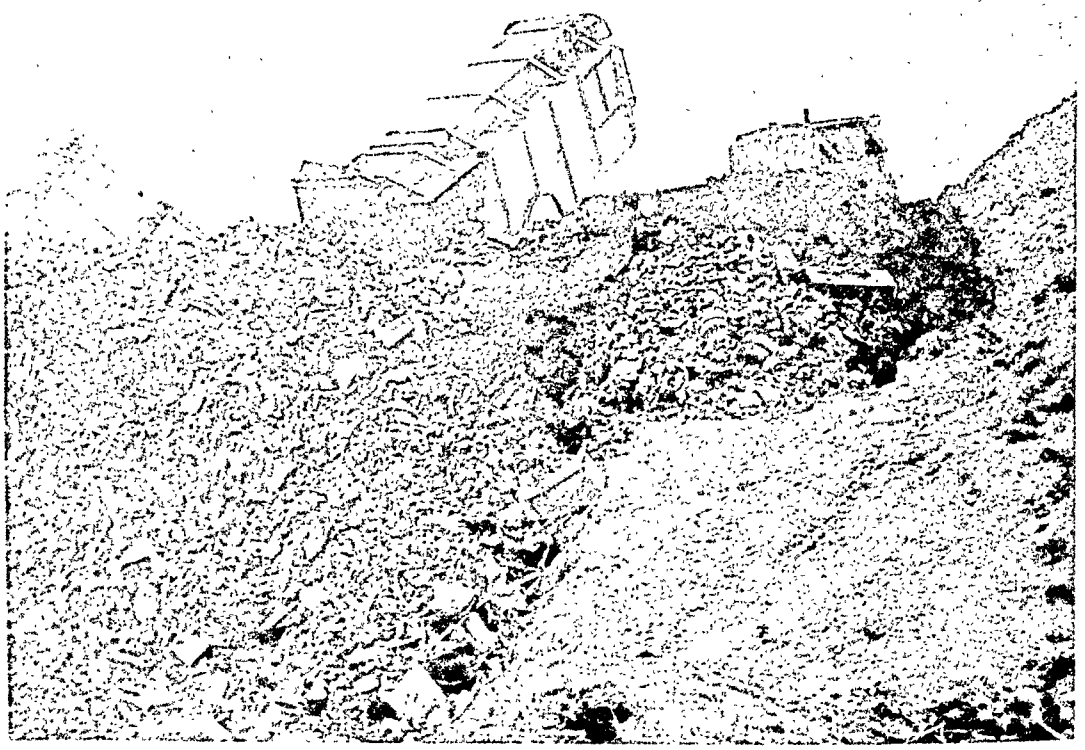
As a result of this type of controlled operation of the land-fills, there was developed during the last 3½ year period a procedure for handling these wastes, which provides a nuisance-free land-fill which is in no way to be compared to the refuse dumps of the past. The procedure prevents fires, eliminates rat breeding, minimizes the fly nuisance, permanently takes care of previous mosquito breeding areas, and avoids objectionable odor nuisances.

Keeping in mind the problem of economic hauling distances, low-lying mosquito-breeding marshlands, not too close to habitations, are selected for these land-fills. Here, preliminary preparations are made, staking out the areas and elevations for the work. The first operation is to bring in dragline excavating machines with a 70 to 80 ft. boom, to excavate soil and sand to be placed in stock piles for subsequent use as covering material.

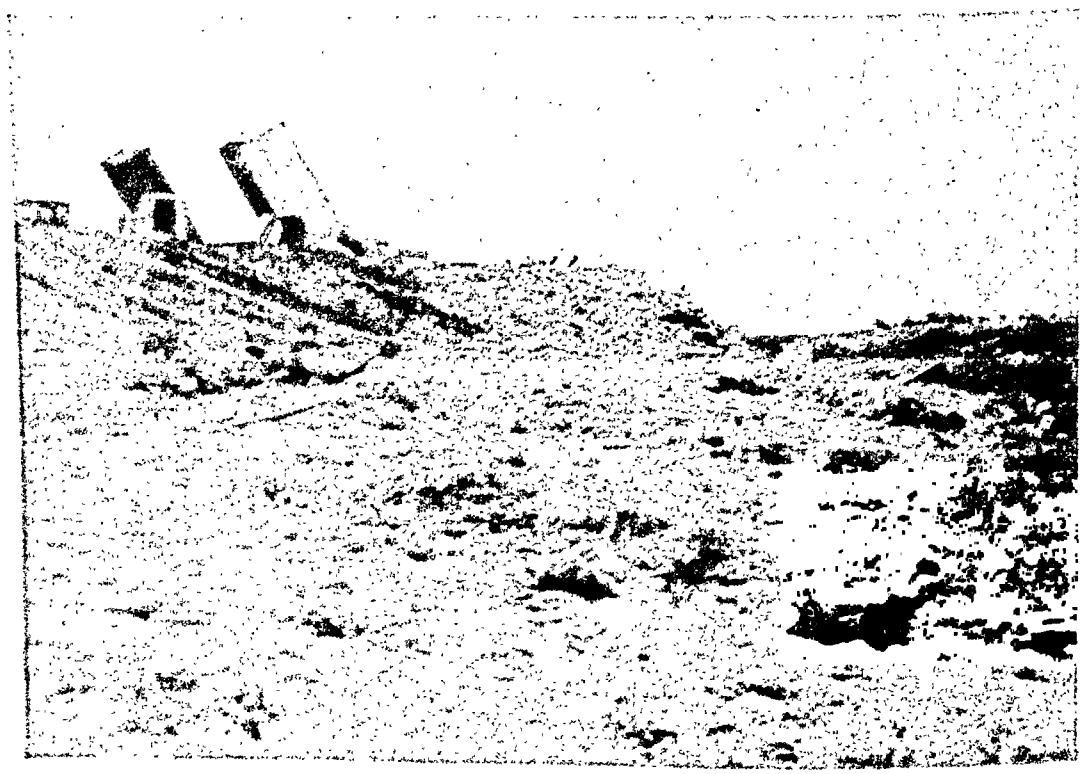
The refuse, brought in by large, self-emptying, covered collection trucks, is discharged into these low or excavated areas. The material is a mixture of miscellaneous city rubbish in which is included from 3 to 10 per cent of household garbage and food refuse. Tractor bulldozers weighing 19 tons level off and compact this material. At the end of each day's dumping operation, a 6 in. soil or sand cover is placed over this material. A raw edge slope of limited extent is exposed only sufficient to allow for subsequent operations at the fill. When the fill reaches the desired grade, a sealing cover of 2 ft. of sand or soil is added. Special emphasis is put on the importance of adequate covering material properly applied on the surface and the face of the fill. As an added precaution there also might be a sand filled boundary trench at the base of the slope.

As the operation proceeds, the sloping edge of the fill is given as much consideration as the top, to prevent rat harborages, fires, or fly nuisance. Where the slope of the fill ends and the marsh begins, it has been found good practice to provide a clean sand seal of several feet thickness, which will prevent rodents that harbor in the marshes from burrowing and locating new homes in the refuse land-fills. A 6 ft. snow fence is maintained around these dumping operations, to trap paper and litter that may be blown away from the fill. There have naturally been questions raised as to the presence of disease-causing bacteria which may present a health hazard. The question has also come up whether the gases produced by fermentation may give rise to spontaneous combustion or odor nuisances. These matters have been studied by the technical advisory committee, and by the WPA land-fill project to which we have previously referred. No indications of such hazards have yet been shown, and practical conditions confirm this point of view.

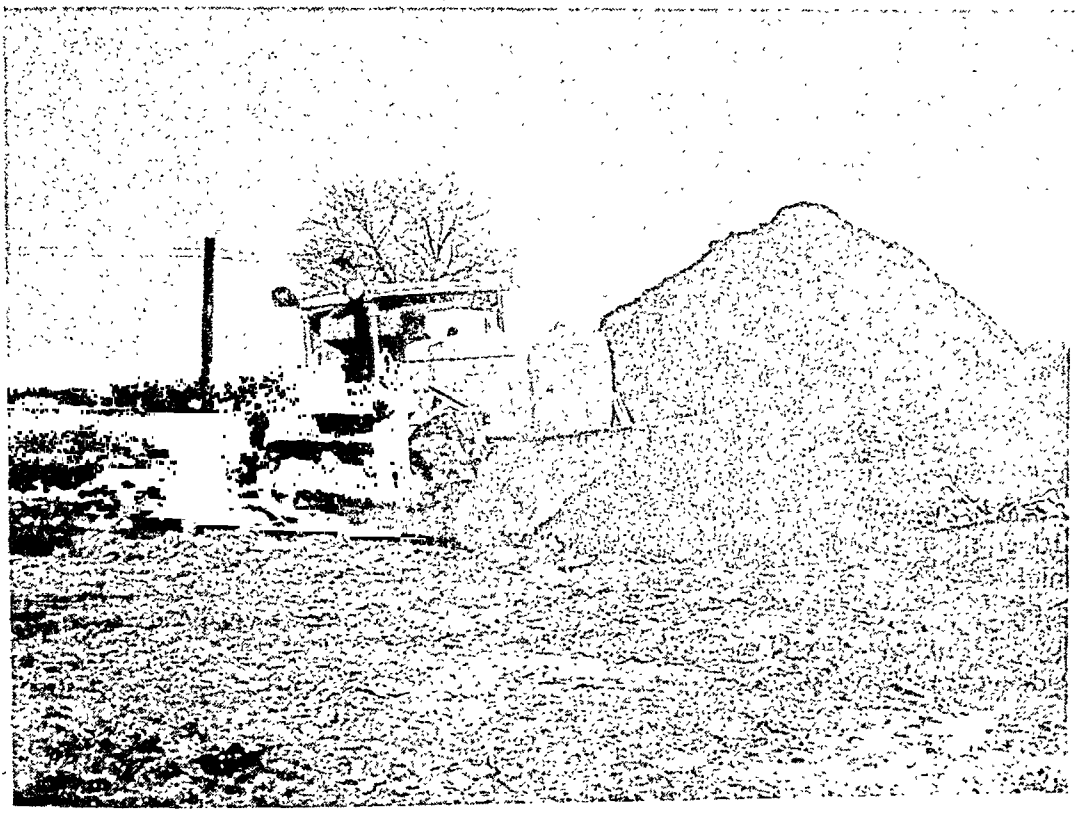
This plan has made possible the reclamation of substantial areas of lands hitherto unfit for use, which are now quite adequate for parks, playgrounds,



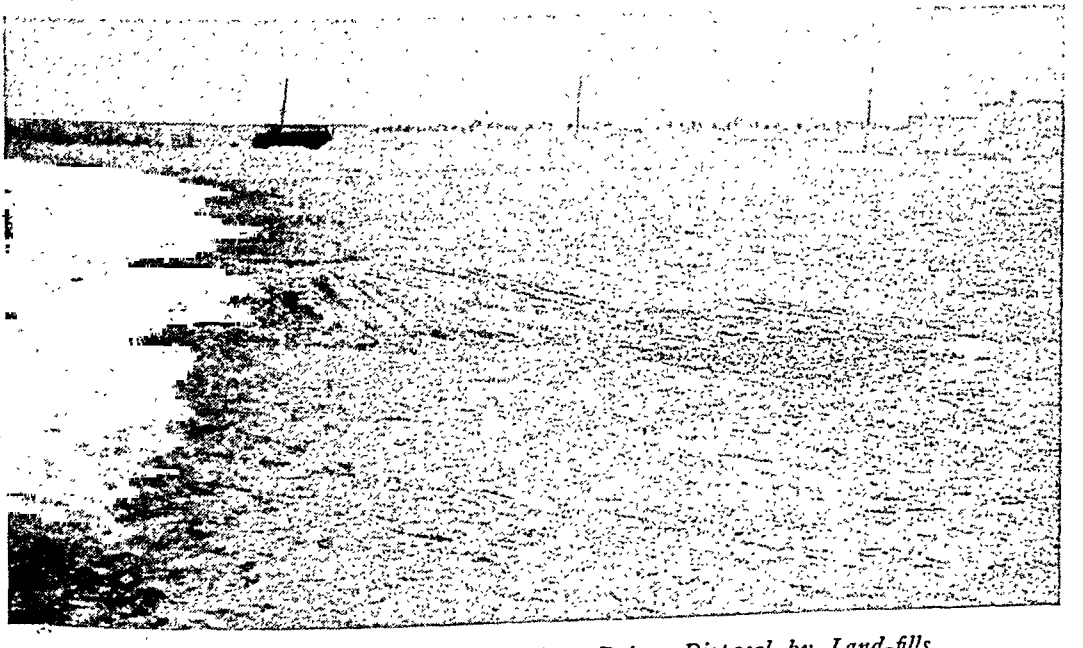
Discharge of Garbage and Other Wastes from Trucks on Dumping Front—Refuse Disposal by Land-fills



Dumping of Wastes Along Working Front—Initial Earth Cover Placed After Compacting Refuse Disposal by Land-fills



Compacting of Material by Bulldozer Tractor and Spread of Cover Material—Refuse Disposal by Land-fills



Completion of Grading and Covering—Refuse Disposal by Land-fills

air fields, and, in all likelihood, for ordinary building structures. Acknowledgment should here be made to the Sanitation Department and Commissioner William F. Carey through whose vision, energy, and enterprise this modern, scientific engineering project was made possible.

In New York City, the Sanitation Department is disposing of 9,000,000 cu. yds. of refuse and garbage per year through the use of land-fill. That department has completed 5 land-fills and retrieved for useful purposes a total area of 325 acres. It is now working in 10 additional areas, which, when completed, will reclaim 1,000 more acres. The complete cost of disposal of waste by land-fills has been 7½ cents per cu. yd. as against 30½ cents per cu. yd. when incineration is used. In addition, the land-fill method provides for greater economy of use of equipment and less investment in fixed plants, and avoids some of the other problems with incinerators, such as smoke, fly ash, and local objection to the permanent structures.

We have no intention of condemning well operated incinerators as a method of disposal of these wastes. However, we do wish to point out that a properly conducted land-fill procedure is more economical, can be carried out with as little inconvenience to the public as incinerators, and is better adapted in a good many ways to the situation in our city. By disposing of 4,000 truckloads of waste material daily through land-fills, the Department of Sanitation has been able to close up 11 of the smaller and less efficient incinerators out of the total of 22 incinerators formerly in operation.

It may be stated here that a very similar method of disposal of refuse has been receiving prominent attention and widespread use in recent years in England, where it is known as "controlled tipping." This method has been the subject of organized scientific research, particularly at Manchester, and the extensive report of the experimental test carried out at that place in 1932 and 1933 produced the following conclusions: The disposal method of "controlled tipping is definitely sound and safe"; that it is "highly improbable that disease-causing pathogens can multiply or continue to live within any tip . . . there is no more reason to acquire undesirable bacteria during a stroll over an area where controlled tipping is taking place than it is by taking a walk along a field path in the country or when working in his garden"; that "there is no explosion hazard nor are the gases odorous." This disposal method has received recognition of the British Ministry of Health, and has recently been employed for the disposal of about one-sixth of the municipal refuse dealt with in England and Wales. In this country, a method of land-fills has been very successfully used for the past 5 years by the city of San Francisco, and has also been employed by Fresno, Calif., Portland, Ore., Tacoma, Wash., and other places.

We would like now to return to the New York City court action matter. When groups of citizens began sending to the Health and Sanitation Departments general objections to the land-fill operations, we had regular inspection visits made by representatives of our two departments, and also called upon sanitary and health experts who were available in our vicinity to make inspections and give us their opinions. We became convinced that these land-fills did not result in a nuisance nor endanger health, and that they were thoroughly justified in the interest of economy to the city. Nevertheless, pressure was brought repeatedly to bear on city authorities to discontinue entirely all these dumping operations. This was followed, as stated, by the indictment of the Sanitation Commis-

sioner and the Health Commissioner, on the grounds of maintaining public nuisances and failing to act and cause the abatement of public nuisances, allegedly caused by operation of city land-fills.

In due course, the case came up for trial at which time an agreement was reached between the District Attorney, and the Corporation Counsel, with the approval of the Court, whereby the indictments against the City Commissioners were dismissed and the entire issue, namely, whether such land-fills constituted public nuisances or endangered the public health, was referred to a committee of experts to be appointed by Surgeon General Thomas Parran of the U. S. Public Health Service. The members of the committee as appointed by Dr. Parran included the following: Dr. M. J. Rosenau, Dr. E. L. Bishop, Dr. Huntington Williams, Dr. Kenneth F. Maxcy, and R. E. Tarbett.

The final report of these experts, which was issued in March, 1940, gives, we believe, a reasonable and correct answer to the question, "Do land-fills endanger the public health or safety?" Their answer was, "No."

In the opinion of this group—

> There are no conditions presently obtaining at the 5 land-fills which endanger the public health or safety. On the contrary, the committee is convinced that certain potential public health hazards obtaining previously at the sites of these fills have been diminished, for filling is one of the best methods of controlling rats and mosquitoes in marshes and swamps.

The committee furthermore states:

> We realize that an ideal method for the disposal of wastes of a large city has not yet been evolved, and that methods must of necessity vary with local conditions. Moreover, the choice of a method is influenced by considerations of administration, efficiency, and economics. We are not asked to pass upon such considerations. Likewise, we are not asked to determine whether the sanitary or regulated land-fill is the best method which could be used in the Borough of Queens. The committee is asked in the stipulation to answer specific questions as to whether there are any conditions presently obtaining, or to be expected in the future, which might endanger the public health or safety at the 5 land-fills mentioned.

Not only has the principle of public health been vindicated, but by this method of adjustment of the issue, the public has benefited, as the following recommendations made by the committee will show. The committee, however, in making these recommendations, did not intend to imply that the procedures recommended were not being followed in whole or in part. Here are some of those recommendations:

1. The disposal of wastes by the land-fill method should be planned as an engineering project. Operation and maintenance should be under the direction of a sanitary engineer.

5. Waste building material, concrete or other bulky waste material which may furnish rat harborage should not be used for the final surface or side slopes, but should be promptly incorporated within the fill.

6. The final covering for surface and side slopes should be maintained at a depth of approximately 24 in.

14. Inspection for and control of rodents should be maintained until the fills are stabilized.

15. After the active period of filling operation is completed, a maintenance program should be continued until the fill has become stabilized so as to insure prompt repair of cracks, depressions, and erosion of the surface and side slopes.

16. Studies of the varied problems involved in land-fill operations should be continued and should include researches into the biological, chemical, and physical activities, as well as the engineering, economic, and administrative aspects of the subject.

NOTE: Comments on the committee report and some of the recommendations are given in a news item in this journal, see *A.J.P.H.*, 30, 7:850 (July), 1940.

Other recommendations related to such matters as maintaining narrow working faces on these fills, prompt covering of exposed surfaces with earth to make a closed cell of each day's deposit, covering of surface and side slopes with earth to a depth of 24 in.,

termination of boundary side slopes in a sand and gravel-filled ditch, spraying to lay dust, restricting the packed refuse layers to a depth of about 8 ft., and maintenance of water under pressure for fire fighting purposes.

A direct result of this experience with land-fills has been a much improved disposal procedure for refuse; public health practice has been strengthened by the decision that health experts rather than courts decide such issues.

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Public Health Engineering Aspects of Epidemiological Investigations of Water- and Food-borne Outbreaks*

ARTHUR E. GORMAN, F.A.P.H.A.

Engineer of Water Purification, City of Chicago, Chicago, Ill.

IT is a well established fact that the investigation and control of an outbreak of disease of any considerable magnitude, whether it be in a community, an institution, or a single building, calls for a high order of team work. The services of individuals representing a general cross-section of the activities of a well balanced public health organization may be called upon before such an outbreak is brought under control and its cause or causes established beyond a reasonable doubt.

This paper is directed particularly to public health engineers in the hope that it may serve to indicate a broader conception of their responsibilities in dealing with outbreaks of disease, especially in regard to the application of engineering knowledge and experience in environmental sanitation, and possibly to point a way to more comprehensive coverage of their assignments. It is also offered with the thought that it may suggest to epidemiologists in charge of investigations more effective ways by which engineers and the engineering viewpoint might be used to help them in interpreting the significance of the large amount of data usually collected in the investigation of an epidemic.

The rising importance of water as a medium of transmission of diseases other than typhoid fever and gastroenteritis is emphasized by the fact that in recent years water has been the cause of, or under strong suspicion as having been involved in, the transmission of several diseases which a decade or more ago were not generally considered water-borne—at least in epidemic form, namely: amebic dysentery (Chicago 1933); epidemic jaundice (Smolan, Kansas 1935, and Burney, California 1939); tularemia (Russia 1935; *Bacillus tularense* was found in three streams in Montana 1939); undulant fever (Michigan State College 1939); poliomyelitis (Long Island 1931).

There is also evidence of an increasing number of food and milk-borne outbreaks in such institutions as schools, hospitals, jails, asylums, industrial plants, camps and summer resorts. Infections by organisms of the Salmonella group seem to be most common with *Salmonella aertrycke* often the causative agent. Furthermore, a number of outbreaks of illness characterized by sudden onset, nausea, muscular pains, cramps, projectile vomiting, absence of fever, and rapid recovery—within 24 hours—have also been reported, for which the true etiologic agent has not been found.

* Read before the Engineering Section of the American Public Health Association at the Sixty-ninth Annual Meeting in Detroit, Mich., October 10, 1940.

In water-borne epidemics and to a lesser degree those involving milk and other foods, the impelling forces which start the outbreaks and the various avenues by which infection is spread are often so deeply rooted in the environmental aspects of community life that their discovery and the determination of their true relationship to the epidemic may require a most painstaking investigation, coupled with special knowledge of local conditions and operations. Here the alert public health engineer often can be of real service to his colleagues in the investigation, particularly if he is called during the early stages of the outbreak and is kept informed of developments.

Epidemics have a negative as well as a positive phase. The positive phase may be defined as that related to the spread of infection and is indicated by persons made ill or found to be infected; the negative phase is that related to the paucity or absence of infection and is generally indicated by non-cases. Frequently, clews as to the cause of an epidemic, which are difficult to follow in the positive phase, may readily be developed from the negative phase. This is especially true if environmental factors are involved. When the correct solution is found, the positive and negative evidence should complement each other, presenting a complete story of the epidemic. This happy condition is the goal of all investigators —one rarely attained and not infrequently barely approached.

Given the proper chronological and statistical picture concerning an outbreak, the experienced public health engineer can intelligently explore possible avenues of infection related to the environment and normal or abnormal operations of a community, institution, or home. He can evaluate his findings in the light of the epidemiological facts assembled, and assign each, if involved, its proper place in the chain of events which lead to the outbreak. There must be an unraveling of related factors with nice discrimination in the elimination of nonessentials. However, details must not be overlooked, as among them leads to valuable evidence may be found. The investigator must expect to backtrack his trail many times as "dead-ends" or what appear to be such are encountered.

Once the onset diagram for an epidemic is charted and adjusted for the incubation period, the time that infection first became widely disseminated usually may be established within reasonable limits. But an investigation must go much deeper than this; it must establish the source and type of infection, and the circumstances which released it to strike the afflicted community. In typhoid fever outbreaks, bacteriophage typing of the organism, as used in the Los Angeles epidemic of 1939, gives the epidemiologist a new tool to work with.

Not infrequently the specific factor which suddenly cleared the way for infection to travel from person to person was the resultant and cumulative effect of some indirect and distant force set in motion days, weeks, or even years before an outbreak began. Therefore, in considering possible circumstances surrounding an epidemic from the environmental viewpoint, one must often consider cause and effect both in the foreground and in the long perspective of time. For example, the wooden plug which was driven into the overhead sewer pipe above the drinking water storage tank in the basement of the Congress Hotel, in Chicago, where the famous amebic dysentery epidemic of 1933 occurred, undoubtedly had served many years as an effective plug, before advanced decay of its fibers made leakage possible, and started one of the most notable water-borne epidemics of modern times.

As a further example, the writer

knows of a case where an iron bulkhead improperly set by a diver in 1900 permitted leakage of more or less polluted shore water into a water tunnel for nearly 23 years before a combination of circumstances developed to permit mass infection to pass through the opening around the bulkhead at a time when chlorination was apparently inadequate, and thus cause a major typhoid fever outbreak.

Many outbreaks where water or food is involved are the culminative effect of several forces acting simultaneously. One or more of them may have acted for years without causing infection to spread, but sooner or later as the wheels of chance roll, the "jack pot"—little or great—will be struck and precipitate an epidemic. The public health engineer who is to be successful as an engineer-epidemiologist must train himself to look for the resultant effect of a variety of potential causes, and must consider the long term as well as the immediate action of each.

In investigating water or food outbreaks, the public health engineer should always seek evidence of abnormal conditions or operations in or related to the affected area. This may begin with such general environmental items as abnormal weather conditions and continue on down to the most detailed duties or habits of operating personnel at a plant or institution.

If water is involved, the public health engineer early in his investigation should assemble the facts concerning meteorological conditions in the district or region involved. Because of the highly infectious character of sewage, items affecting its removal and disposal should be given special attention. Excess rainfall may mean surcharged sewers, abnormal operation of sewage pumping equipment, excessive pressures in sewers, or the use of overflows and by-passes. In buildings the operation of sump pumps or air ejectors should be carefully checked. Drought may lower ground water levels, deplete normal sources of supply and necessitate the use of others. Freezing weather may cause broken mains or clog intakes resulting in the use of emergency intakes. Changes in barometric pressures may develop seiches on lakes, causing sudden "turnover" with depletion of oxygen in the lake water and often a sharp increase in its chlorine demand properties, thus lowering the disinfecting value of the chlorine applied. A wind storm may cause a tidal wave with destructive force flooding plants and equipment; or it may cause the sudden drift of pollution toward water intakes normally at a safe distance from sources of contamination. Excessive heat or high humidity might result in such a heavy demand for water for sprinkling or air conditioning as to reduce pressures to a point where negative head may occur periodically in the upper parts of the distribution system. Low pressures in localized areas might necessitate repumping of water within plants or buildings direct from the public main, causing negative pressures in pipes connected to the suction side of the pump.

Abnormal operating conditions in a community, such as a large fire, an explosion in a sewer or plant, an interruption of power, a main break, a surge in a tunnel, water hammer in mains, or the erroneous closing of important valves in the system, may have a direct or indirect effect on the chain of circumstances that bring about a water-borne outbreak.

In large modern office buildings, schools, hospitals, hotels, industrial plants, and institutions, the population is frequently larger than in many well organized cities; yet the supervision over service to the public often may be inferior to that which might be exercised in even a small town. Sometimes just the reverse is true. In some cities

where the water supply is not filtered, it is common practice in large buildings and institutions to filter the water in pressure filters and to soften that used for washing and laundry purposes. Where chemical treatment of the water is provided for, care must be taken to see that the chemicals are used correctly, and that they are stored in containers which are properly marked, so that mistakes in use will be avoided. Water treatment chemicals should be kept separate from all other supplies, and preferably under lock and key. It is not uncommon in some buildings to find boiler feed water chemicals, radiator anti-leak compounds, calcimine, cold water paint, washing powder, insecticides, rodent poisons, fertilizers, etc., stored in miscellaneous cans, barrels, and bags in the same room in the basement under conditions where mistakes in identity and use could easily be made. Not infrequently the same shovel or scoop may be used in handling a variety of such chemicals.

Operating details such as changes in personnel during shifts, vacations, or relief periods deserve careful checking. The day and even the hour when infection was let loose may sometimes be established from a close scrutiny of operating details, particularly such records as hotel or hospital admissions and releases, school absences, meal menus, order books, operating logs, diaries, recording gauges of all kinds, sales slips, and drug prescriptions. Even seemingly insignificant records and events in the community or institution which account for the presence of persons ill, or the absence of persons not ill, from the probable place of infection may prove invaluable in establishing evidence. For example, in investigating a water-borne outbreak of considerable magnitude which followed a great mid-western fire a few years ago, the exact time when chlorination of a grossly polluted water supply stopped was established from the chart of the recording pressure gauge on the discharge of a pump.

When a plant has been shut down for an extended period and is then put in service again, or when it has been remodeled for new tenants, some changes in water supply and sewage piping are almost sure to be made. If an outbreak of illness occurs under these conditions it is well to investigate such possibilities. New operating personnel in old plants are likely to make changes in piping and plumbing without giving due consideration to potential hazards unknown to them.

In institutional and building outbreaks, local operating practices and plant layouts must be investigated very carefully. Altogether too often members of the operating and maintenance staff may make radical changes in the plant service or utility systems without giving proper notification to other responsible officials or tenants, with the result that while normal institutional functions are being carried out, essential services are unexpectedly shut off or reduced. Not infrequently, this lack of coördination will cause conditions to be established which jeopardize the public health. In a hospital, the shutting down of a steam plant for repairs might seriously affect the steam sterilization of instruments for an emergency operation. In a bakery or kitchen, interruption of sources of heat, whether gas, electricity, or steam, might seriously affect cooking procedures, permitting foods presumed to have been sterilized by cooking to be under-heated or possibly kept at temperatures favoring bacterial growth. Food in storage may be affected by the shutdown of refrigeration equipment for repairs.

There is, however, another side to this situation. In many institutions, such as hospitals and hotels, funds for equipment and maintenance are allotted liberally to those services which can be seen by the public, but are grudgingly

granted for proper maintenance and recording equipment in such important service departments as the power plant, laundry, kitchen, and building maintenance. This is a decidedly short-sighted policy. It is obviously ridiculous to spend money on lavish equipment in a hospital operating room and then neglect proper maintenance of the steam, water supply, or lighting services, so essential to the proper operation of the hospital.

In any well managed plant, the chief operating engineer should keep a daily log of all equipment in service, including such recording devices as are essential to efficient control, such as pressure gauges, meters, weighing devices, and thermometers. Information from these sources is not only important for good operation, but is of inestimable service in investigating food- or water-borne outbreaks.

In institutional outbreaks the sex, age, occupation, lodging houses, and place of work, meals, and recreation of persons made ill, as contrasted with those not ill, may provide important leads which can be coördinated with known operating practices to establish evidence which will help solve important epidemic problems. For example, if cases of illness in a school, hospital, or institution are all on one floor or in one wing, this fact may be of real significance if the outbreak is water-borne. Cases on upper floors are suggestive of contamination through back siphonage, because as a rule negative head is created in the upper section of the piping. Cases confined to one section or wing of a building direct suspicion to conditions related to one or more local riser pipes serving that area. If water is involved, and cases are generally distributed throughout a building, the contamination is more likely to be at the source of supply or at a point before the system branched off to various parts of the plant.

If plumbing fixtures are supplied by "up-feed" piping, the hazards related to back siphonage are much more serious than with "down-feed" systems. In the former the water pipes for plumbing fixtures on a given floor take off from the header near or above the ceiling of the floor below and feed upward; in the latter, they take off near the ceiling of the respective floor supplied and the feed is downward. In the "up-feed" system it takes but a slight negative head to cause back siphoning of polluted water from fixtures with submerged inlets into the main supply header, whereas in the "down-feed" system a negative head of many feet must obtain before serious contamination of the water supply of the building can occur.

A few years ago, in investigating an outbreak of illness in a large mid-western grammar school, the writer was attracted by the fact that all of the reported cases were among pupils in three or four rooms near the end of a corridor on the second floor of the building; also that the case incidence was over 50 per cent higher among girls than boys, although in these rooms the distribution of pupils by sex was about even. Near the end of the corridor there was a drinking fountain just outside the door to the girls' toilet room. This directed suspicion to the water system serving the toilets and the drinking fountain. It was found that they were supplied from the same pipe in an "up-feed" system; also that the toilet bowls had side-spud connections with submerged inlets and flushmeter valves. It was the practice in this school to drain the water system completely over each week end during the winter months to prevent freezing of pipes.

Suspecting back-siphoning of fixtures when the water system was drained, a special test was conducted. A strong chlorine solution was poured into each toilet bowl and the water level marked.

The janitor was then asked to drain the system in the usual week-end manner. Within a fraction of a minute after he opened the basement drain, an 18 inch vacuum was recorded on a compound gauge installed on the water line, and the water level in the bowls dropped nearly an inch. Samples of water collected from the drinking fountain and tested for excess chlorine with orthotolidin, showed a brick red color where previously only a pale yellow color had developed. This was clear proof that the week-end practice of draining the water system could cause siphoning of the girls' toilets and gross contamination of the drinking fountain.

Attempts to repeat these results at a similar fountain outside a boys' toilet in this school failed, and no vacuum was recorded. The reason was found in an "over-the-top" connection to an automatic flushing tank for a battery of urinals. This open connection served as a vacuum breaker on the water system to the boys' toilets.

In food-borne outbreaks it is of prime importance that all foods under suspicion be impounded promptly and that sample be collected for such laboratory analyses and research work as circumstances indicate to be desirable. Foods shown by analysis to be safe can be usually released for use within 48 hours. In the meantime, the use of food supplies from a new source should not cause inconvenience out of proportion to potential risks involved in continuing the use of normal stocks under suspicion. The day and meal the alternate food supplies were substituted may later prove to have very important epidemiological significance.

In food-borne outbreaks the public health engineer should check promptly all equipment and utilities used at the place under suspicion. He should also acquaint himself in detail with all operating practices with reference to the use and maintenance of this equipment. The water supply, plumbing, and drainage facilities should be investigated thoroughly as in the case of a waterborne outbreak. Refrigeration plants and equipment—especially if ice is manufactured below grade—should be checked for exposure to contamination by overhead drains or backflow from sewers. Garbage and refuse disposal methods should be carefully checked.

Structural defects which permit infestation of the premises by rodents, vermin, and insects may be very important factors. Heat control and recording mechanisms on stoves, ovens, dishwashers, pasteurizers, and similar equipment should be checked and calibrated for accuracy. Storage rooms for supplies should be investigated to determine whether or not they are subject to overhead contamination or flooding, and to see that food is not stored directly on the floor. Tables and racks where food is prepared and served, or where dishes and utensils are stored, should not be directly below sewer lines, drains, or sprinkler heads. Warming trucks and steam tables should be examined for cleanliness and location with reference to exposure to contamination.

It would be well to check all open containers in rooms where food is prepared, to see that no poisons are handy which might be mistaken for flour, sugar, or salt. It is a common practice of cooks and bakers to use quart and gallon tin cans for convenient retention of salt, sugar, flour, meal, washing compounds, and even insecticides. Identifying markings on the cans are the exception rather than the rule. Under such conditions a new assistant or utility man might carelessly mix poisonous substances with edible products in the preparation of food.

Poisons of all kinds should, of course, be kept out of kitchens and bakeries, and if insecticides must be used one of the Pyrethrum powders or solutions should be obtained.

Anyone who is investigating a food-borne outbreak would do well to act as an observer of the normal operations of employees in the kitchen, pantry, bakery, or other place under suspicion, and take detailed notes of the practices of the various employees. In difficult cases this may be a very important assignment. In terms of potential hazards the practices of such employees may prove a revelation. For cleaning purposes, elbow grease, hot water, and soap are much to be preferred to scraping and excessive use of covering materials, paint, and chemical disinfectants.

Milk and dairy products should if possible be purchased in containers so sized that once opened the contents will be consumed rapidly. Storage of any food products in open containers should be discouraged as much as possible. Ice should be handled and stored under hygienic conditions. Every effort should be made, if possible, to keep ice out of direct contact with food and drink. In hospitals where ice may be used in packs and oxygen apparatus, it must be so stored in the wards that this same supply of ice will not be used to cool drinks.

CONCLUSIONS

1. It is evident that the rôle and responsibilities of the public health engineer as a team worker in the investigation of water- and food-borne outbreaks of disease, especially from the standpoint of environmental sanitation, is an important one, possibly more so than is realized by public health engineers and epidemiologists.

2. The widening importance of water in the transmission of disease is indicated by the fact that, during the last decade, it has been reported that water was involved or under strong suspicion as the vehicle of transmission of the etiologic agent in outbreaks of amebic dystentery, epidemic jaundice, tularemia, undulant fever, and poliomyelitis, not previously considered as water-borne diseases.

3. In investigating outbreaks of disease from the environmental standpoint, the public health engineer serving as an engineer-epidemiologist, must be fully informed as to the chronological and statistical aspects of the epidemic, and then seek to interpret environmental conditions and operating practices in the area affected, as they may have a bearing on the epidemic.

4. Possible contributory causes of food- and water-borne outbreaks must be considered in their long-term cumulative effects as well as their more immediate influence; and consideration must be given to the fact that an outbreak in a community may be the resultant effect of multiple hazards which merely awaited a precipitous circumstance to become operative.

5. There is need for a more thorough "follow through" of water-and food-borne outbreaks, especially in establishing a clear case as to the avenues through which infection was transmitted; altogether too often lack of such evidence is due to inadequate or incomplete investigation of environmental conditions for which service the public health engineer is especially qualified and, therefore, has a real responsibility properly to perform.

Are we public health engineers measuring up to this responsibility?

A Restatement of the General Hospital Situation*

JOSEPH W. MOUNTIN, M.D., F.A.P.H.A.

U. S. Public Health Service, Washington, D. C.

IN recent months, as doubtless all of you well know, a hospital bill has been written up and started through the legislative process. Whether this particular bill survives or falls by the Congressional wayside, it is more than likely that one day we in public health shall be seriously undertaking the task of equalizing the hospital facilities among the regions and among the people of this nation. Last winter, in preparation for hearings on pending legislation, the U. S. Public Health Service canvassed the health officers of the country for their opinion as to the need for additional hospital facilities.

Their replies offer an interesting commentary on their practical understanding of the extent and use of hospital facilities of different types.

On the whole, the health officers took the statistical approach in reporting on tuberculosis beds. Starting from available beds and reported deaths, they made careful estimates of the facilities required for their potential patient load. They also took into account the possible effects of an aggressive case finding program upon their estimates. They considered the trend in tuberculosis mortality and trimmed their forecasts accordingly. In their recommendations they went into detail as to size of unit, location of unit, type of construction, and so on.

These health officers also revealed themselves as informed on that all important point of finance—the amount of money required for constructing and operating added facilities. They were not at a loss as to the sources from which such funds might be obtained. All in all, they turned in a good performance.

It does not detract from that performance to say that the stubborn fight of several generations of crusaders against tuberculosis has helped to produce this attitude of practical understanding. When society began to accept as a commonplace the responsibility for those who have this disease and cannot purchase the proper care, the health officer perforce acquired certain administrative duties which increased as the efforts to control tuberculosis increased. He also acquired familiarity with the problem which divides naturally into two questions—How many tuberculous are there? and What facilities do we need to carry the load?

However, and now we come to the sad part, the health officers did not show a similar understanding of general hospital facilities. The fact that society's acceptance of responsibility for those having general illnesses does

* From the Division of Domestic Quarantine. Read before the Health Officers Section of the American Public Health Association at the Sixty-ninth Annual Meeting in Detroit, Mich., October 11, 1940.

not begin to compare with its acceptance of responsibility for the tuberculous certainly has a great deal to do with this difference in understanding and may be considered an extenuating circumstance. At any rate, they were much less precise in their answers. Some skipped the questions as to general hospital accommodations. Some gave perfunctory answers which indicated quite clearly a lack of interest in the subject. The majority of those questionnaires which came back to us with the greatest promptness carried answers which might be described as dubious clichés, to wit: "Everyone resides within 30 miles of a hospital." "There are plenty of unoccupied beds in existing hospitals." "We cannot support the hospitals we have." "Everyone needing hospital care is receiving it."

These rather loosely dogmatic statements were applied to states showing 1.3 beds per 1,000 population and to those showing 5.3 beds per 1,000; to states with 50 per cent and those with 80 per cent of bed use; and to states varying in patient days of care per 1,000 population from 209 to 1,361 days. Only rarely were deficiencies in outpatient facilities mentioned or inadequacies in any of those services which hospitals furnish in addition to bed care. I hope you will pardon a certain skepticism shown in reviewing these replies, but the question frequently arose as to whose broadside a health officer had been reading.

Now if health officers did not belong in any scheme of events in which general hospitals play a part, this lack of conviction and of information would not matter at all. But they do belong in such a scheme of events. The changing nature of public health has shifted the general hospital into public health prominence. That is just one of those facts of life which we could not dodge if we wanted to. Even circumscribed programs of public health may demand the use of the hygienic laboratory, the x-ray, the electrocardiograph, basal metabolism apparatus, and similar aids to diagnosis and therapy. Health departments of today require clinic facilities, and many of the patients who come to those clinics will prove to be in need of bed care. Hospitalization is absolutely necessary in numbers of maternity cases. Some of the venereal disease cases can be treated to better advantage in hospitals than on an ambulatory basis. Tuberculosis sections to general hospitals are now being recommended by many authorities. The old isolation hospital is losing vogue, for with modern technic and facilities communicable diseases may readily be handled in a unit of a general hospital.

This relationship, which has developed into interdependence, between hospitals and public health agencies has been ably covered in reports of committees [1] of the American Public Health Association and the American Hospital Association. Unless such reports are to be abortive, which heaven forbid with all the work to be done in getting people to hospitals who need hospital care, they should be made the preliminaries to action.

In considering what I should say before you today, I have taken into account my own feeling as to the importance of this whole subject and my dismay at the lack of interest and understanding on the part of health officers as an excuse for presenting the ABC's of the general hospital situation in the United States. Some of you may feel that what I have to offer appears to be a rehashing of much that has been said and written before, and you will be quite right—it is a rehashing, but I hope you will bear with me because I think it is important.

EXTENT OF HOSPITAL FACILITIES

I would like to devote one paragraph

to a few summary figures on facilities and services afforded by hospitals of the three medical types. The general and allied special hospitals * registered by the American Medical Association [2] number 4,900 and include 490,000 beds. Some 9,400,000 patients are admitted annually to these beds and are given over 122,000,000 days of care. Mental institutions are less numerous, numbering in all only 600, but they are large for the most part, they operate at maximum capacity, and their turnover of patients is low. A total of 210,000,000 days of care is given in mental hospitals each year, but the number of new admissions is only 190,000. The tuberculosis hospitals number 480 and have a combined capacity of 76,000 beds. They admit 91,000 patients annually and furnish 24,000,000 days of care.

In analyzing the distribution of hospital facilities, I shall offer only figures on the general and allied special hospitals. Not because the mental and tuberculosis hospitals present no problem, but rather because the general and special hospitals are the institutions to care for some of the most unregarded needs among our population—the need for hospital assistance in meeting old chronic ailments and new acute ones, the need for care in communicable disease, in childbirth, or in orthopedic impairments.

More than 400,000 beds are distributed among some 4,500 registered hospitals which represent the aggregate general and special facilities owned by non-federal agencies. Hospitals operated by the federal government are excluded since they serve only certain classes of beneficiaries and are not available for general use to the people of the areas in which they are located. Of these 400,000 and more beds, one-quarter are under the control of state, county, city, or a combination of county-city governments; almost two-thirds are controlled by churches, fraternal orders, and other nonprofit associations; and one-tenth are maintained by individuals or organized groups referred to usually as proprietary agencies. Like physicians, hospitals derive a large proportion of their income from fees paid by patients. You know exactly what that means—if an institution depends for most of its income upon fees and wishes to remain solvent, it is not going to be able to offer many services to those who cannot pay the fees. To cover the deficit caused by that which they do give in free and part-pay services, they must boost the fees of those who pay.

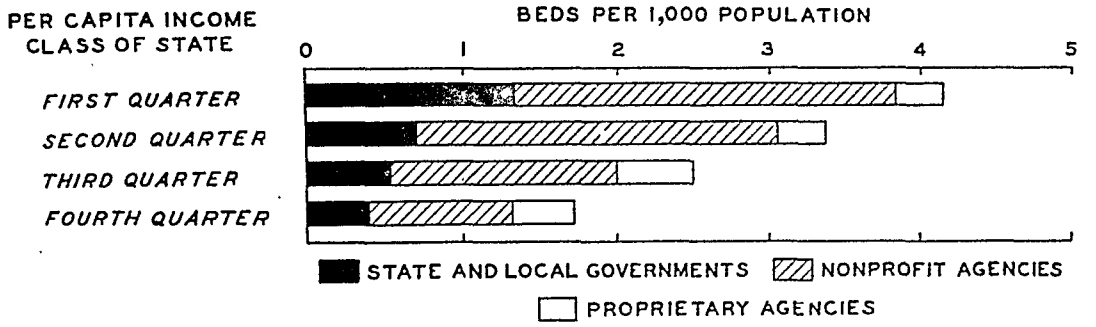
These facts sound so simple when uttered that one is almost abashed to present them in formal discourse, but they are precisely the facts which account for insufficient hospital care, and they are apparently ignored by those who claim that our hospital facilities are plenty good enough.

The charts presented here to illustrate a few of my points show the states divided into 4 groups according to their economic position as determined by per capita income. I should explain perhaps that my basic material comes from data collected by the Public Health Service in connection with its census of hospitals.[3] The per capita incomes are taken from a report put out by the Bureau of Foreign and Domestic Commerce.[4]

The upper quarter of states in Figure 1 includes many industrial states, especially of the Northeast, and also the District of Columbia where the per capita income at $1,165 is the highest in the nation. In other words, this top group represents a population which

* The hospitals included under the term "general and allied special hospitals" are those that furnish general medical and surgical care and such specialized services as are [illegible] for the care of certain types of cases, such as obstetrical cases, contagious cases, mental cases, and the like, or certain types

FIGURE 1—Beds per 1,000 Population in General and Special Hospitals of Different Control, by Per Capita Income Class of State



has a high degree of security, carries insurance on life and limb, and is able to select its medical care.

In this quarter of the states, there are 4.16 beds per 1,000 people. The number drops in the next two quarters where the per capita income is lower and the people consequently are possessed of less security on the whole. In the lowest quarter, which includes the poorer agricultural states, the beds per 1,000 population drop to 1.72. On a population basis, hospital beds under proprietary control are more common in states with low incomes than in the relatively prosperous states. The ironical fact in this distribution, of course, is that proprietary hospitals can offer the least to the poorer populations because they depend the most upon fees from patients. Hospitals in this group derive more than 90 per cent of their income through fees paid by persons admitted for care. You can also estimate with your eye from this graph what our data on analysis show to be true—that hospital facilities managed by state and local governments and by nonprofit associations are 3 times more numerous in the quarter of states reporting highest per capita income than they are in the states in the lowest economic position.

The ratios of beds to population show even wider ranges between individual states than one might suspect from this chart which depicts only group performance. The District of Columbia and the State of Massachusetts, both with high per capita incomes, have more than 5 beds per 1,000 persons, while Arkansas and Mississippi, in the low income brackets, have little more than 1 bed per 1,000.

These contrasts would not be at all unseemly if it could be argued and proved that in the financially favored upper quarter of states there is more illness, and as you go down through descending per capita incomes you find that people are heartier and less susceptible to the various ills of the flesh. Many thorough inquiries have been made in recent years into the amount of illness occurring among the people, and they show that precisely the opposite is true.

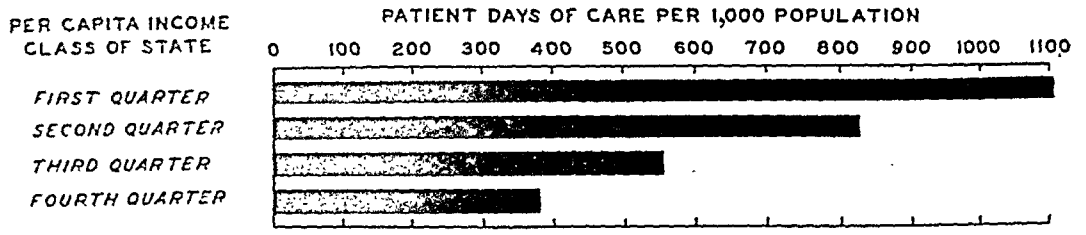
A recent study based upon data from the National Health Survey has this statement on the frequency of serious illness at different income levels [5]:

> The excess in the relief group over the rate in the group with incomes of $5,000 or more is 59 per cent for all causes, 49 per cent for acute diseases, and 85 per cent for chronic diseases.

The following expression of the amount of disability at different income levels is taken from the same report:

> The excess in the low income groups is greater in terms of days of disability per person per year than in terms of frequency, because of a longer average duration of cases in the low income groups. The relief group

FIGURE 2—Patient Days of Care per 1,000 Population in General and Special Hospitals, by Per Capita Income Class of State



shows an excess of 132 per cent over the $5 000 class, and the non-relief group under $1,000 an excess of 68 per cent.

AMOUNT OF HOSPITALIZATION

Now if the per capita income of an area betokens the quantity of hospital facilities existing there, as shown by Figure 1, will it also betoken the amount of hospitalization which goes to the inhabitants? Theoretically, one would guess that it should. Figure 2 says that in fact it does.

Figure 2 is based on aggregate days of care arrived at by multiplying the average daily census reported by the general and special hospitals by 365. Since a few hospitals containing approximately 2 per cent of all beds failed to report the number of patients per day, the total used represents a slight understatement.

Figure 2 tells the story very well of the amount of hospitalization according to per capita income. States of the highest income group show more than 1,100 days of care per 1,000 population; states of the lowest income group show 377 days. The District of Columbia, Massachusetts, and Rhode Island, 3 of the wealthiest members in this union of states, actually exceed 1,300 days of care for every 1,000 persons, while 2 of our poorest members, Arkansas and Mississippi, show a little over 200 days for the same number.

PERCENTAGE OF OCCUPANCY

Our consideration in Figure 3 is the extent to which the available hospital beds are utilized. The idea of percentage of occupancy used in this figure means the ratio of the average daily census to the number of beds reported by the hospital.

According to Figure 1, there are 1.72 beds per 1,000 population in the lowest quarter of states, and 4.16 per 1,000 in the highest. Other factors being equal, one would expect the people who have only 1.72 beds per 1,000 to produce a higher percentage of occupancy than do those people having 4.16 beds per 1.000. But it just does not work out

FIGURE 3—Percentage of Beds Occupied in General and Special Hospitals, by Per Capita Income Class of State

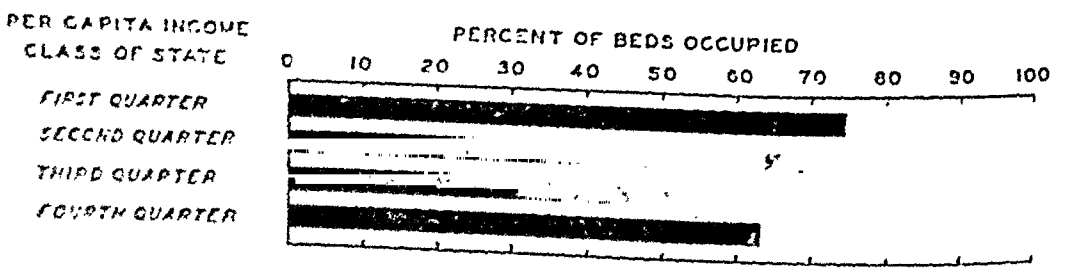
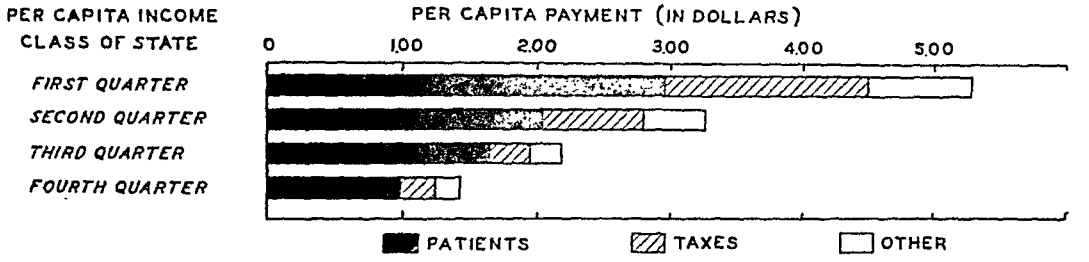


FIGURE 4—Estimated Annual Per Capita Payment for Care in General and Special Hospitals, by Per Capita Income Class of State



this way. In the top group three-quarters of all general hospital bed facilities are occupied. The proportion drops nearly to two-thirds in the next quarter, and goes lower still in the third and fourth quarters. The 2 states lowest in per capita income are the only 2 reporting on the average less than half their beds occupied.

Let me add parenthetically that for larger hospitals 85 to 90 per cent occupancy is considered optimum in usage when computed on an annual basis, since provision must be made for renovation, for emergencies, and for seasonal variation in demands. Small hospitals experience great difficulty in accommodating more than 75 per cent annual occupancy if the service is varied in character.

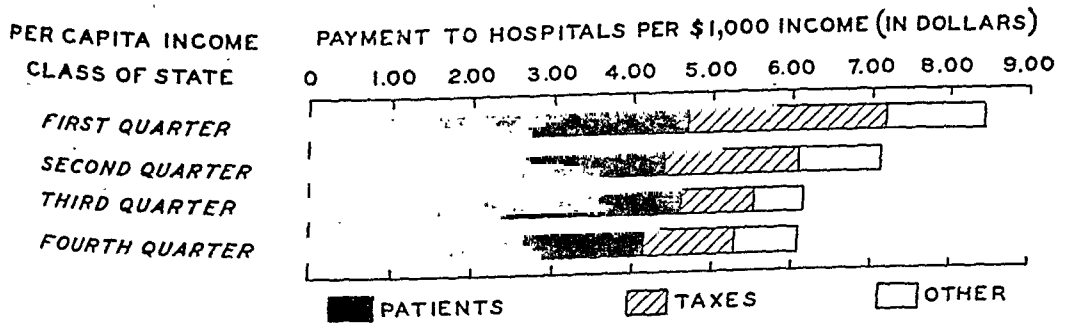
Figures 1, 2, and 3 have this to say, then—that the proportion of hospital beds to population decreases as the per capita income goes down; but, that the people in poorer regions occupy their fewer beds less than the people of prosperous regions occupy their larger number of beds.

SOURCE OF HOSPITAL FUNDS

Figures 4 and 5 present the influence of income upon hospitals and hospitalization through an analysis of the sources of funds obtained by general and special hospitals.

Per capita payments to hospitals are the sums obtained when all hospital income, exclusive of gifts for permanent endowments, is divided by the total population of the area. The estimated per capita payment for the continental United States, I might mention, is $3.37. Figure 4 shows the contrasts between the four groups of states used in this discussion. Per capita payment starts at more than $5 in the upper economic group and drops to $3, to $2, and finally to $1.50 in the lowest economic group. Even more significant than these descending payments are

FIGURE 5—Estimated Annual Payment per $1,000 Income Within State for Care in General and Special Hospitals, by Per Capita Income Class of State



such contrasts as those between the $7.05 per capita payment in Massachusetts and the $.67 per capita payment in Mississippi which are revealed by an examination of data for individual states.

We can better understand the circumstances which govern hospital policy when we consider the per capita payments for hospital care according to the three main sources from which they are derived:

1. Fees for regular and special services collected directly from patients,
2. All tax funds, emergency or otherwise, appropriated by governments,
3. Donations, interest, and miscellaneous income that may be used to meet operating expenses.

According to Figure 4, these sources vary between the four groups of states to about the same degree that the total per capita payments vary. Behind these averages, however, there are certain interesting extremes. Fees from patients from the District of Columbia, wealthiest of areas in point of income, amount to $4.22 per capita, and in the second poorest of the states, Arkansas, they average $.46. The second source of hospital funds—tax contributions—shows a variation from $2.15 in California to $.01 in Alabama. The third group, which includes interest, bequests, and funds from miscellaneous sources, changes from $2.07 per person in Rhode Island to $.01 in Mississippi.

For all hospitals throughout the United States, per capita payments are made up of fees collected from patients to about 62 per cent and of taxes to around 24 per cent. The remaining percentage of their income is derived from various other sources.

Among the states there is wide variation with respect to sources of hospital income. The agency in control, the size of the hospital, and the location of the hospital seem to exert an important influence on supporting financial structure. Proprietary hospitals with few exceptions obtain 90 per cent or more of their income through fees from patients. The smaller hospitals, and especially those existing alone in their respective communities, draw most of their revenue from patients. The large endowed institutions are peculiar to populous cities, especially those in the northeastern part of the United States.

Certain unfortunate implications reside in this high percentage of income from patients. It is the people who are ill and often at the same time handicapped in earning capacity or deprived of it altogether who must carry the main part of the hospital load. Or, if they are unable to carry it, the wage earning members of their family are forced to take it up. Furthermore, the hospital which depends mainly upon fees for income can give only limited services to the very poor and to that marginal class who can get together their necessities but simply cannot manage extraordinary expenses.

It would help if the proportion of funds secured from taxation were larger in those states with less per capita income, but Figure 4 shows that quite the contrary is true.

PAYMENT TO HOSPITALS PER $1,000 INCOME

Figure 5 brings the story down to the individual income, a hypothetical income of $1,000, to be sure, and a hypothetical individual, but nevertheless a basis on which we may personalize these averages to some degree.

In this chart the payments are broken down in terms of $1,000 units of the per capita income, and shown according to the sources from which hospitals secure their funds. It now appears that bequests and governmental appropriations are larger in the first quarter of states, a circumstance to be expected since in states where income is lowest

there will be comparatively few people sufficiently wealthy to be able to make bequests to hospitals.

From Figure 5 it will be seen that when payments to hospitals are related to this $1,000 hypothetical income according to the sources from which they come, the amounts from patients are not noticeably different between the four groups of states. The real story lies in factors not shown in the chart. People in the poorer states have less to spare and are therefore making more difficult payments for the upkeep of their hospitals than are the people in the richer states. Likewise, the total number of days of care is lower by a wide margin in the states of the lower per capita incomes.

OUTPATIENT FACILITIES

I should like also to add a brief accounting of outpatient facilities, since our public health cerebration should take in those persons who may need some hospital services but are not necessarily candidates for hospital beds. My data on this subject come from a study [6] of outpatient facilities which was based upon a questioning of some 1,500 hospitals reported by state hospital associations as offering organized service for ambulatory patients. Eighty-seven per cent of those to which schedules were sent returned them. Of these, however, only 767, or 60 per cent, were found to be operating true outpatient departments. Hospitals in which the control was federal or industrial and those under proprietary ownership were not included since their requirements for admission usually are such that they do not serve the same clientele as do outpatient departments of general community hospitals.

Two-thirds of the departments enumerated in this study were found in large cities of 100,000 or more inhabitants, and this fact takes on significance as you look over population tables for the United States and find that only 3 per cent of the cities come within such a range. Sections of the country in which large cities are situated show the greatest number of general outpatient departments. Such departments with their particular services toward the general health are characteristic of hospitals along the middle and northern Atlantic seaboard, the Great Lakes region, and the West Coast.

FIGURE 6—Geographic Distribution of Hospitals of Different Control and Bed Capacity Classifications in the State of Tennessee

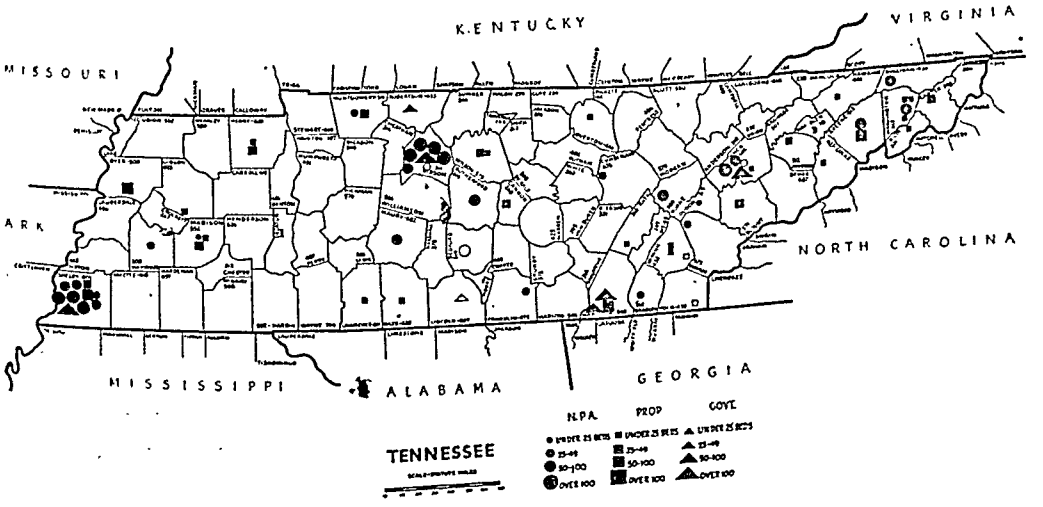


Figure 6 is a spot map showing the hospitals of one state. You will observe that they are shown in their approximate geographic locations by symbols which differ according to control and which also vary to show size. Such a map made on transparent paper may be used over base maps showing population density, economic resources, industrial development, and other characteristics of a state. There is undeniably a dramatic value in showing the hospitals of a state in relation to its other developments by this visual method that cannot be touched by setting out the same facts in a table or a graph, although the latter are of course more precise.

I would like to urge upon all public health workers the importance of analyzing the adequacy of our hospital facilities, an adequacy which must be interpreted according to the need for such facilities and according to the increasing responsibilities of our public health movement. I hope you have gathered from this paper:

That both the presence of hospital facilities and their utilization depend upon the purchasing power of an area.

That the number of beds per unit of population is roughly proportionate to the financial means of the area.

That bed facilities in the general and allied special hospitals are almost 2½ times as numerous in the wealthier states of the first quarter as in the poorer ones of the fourth quarter.

That outpatient departments are to be found for the most part in large centers of population and are most in evidence along the upper Atlantic seaboard, in the region of the Great Lakes, and on the West Coast.

These facts would be only interesting statistical details if they applied to a land where all the poor in compensation for their poverty were blessedly immune from disease. But, as it happens, they apply to the United States of America where illness strikes harder and oftener at the poor and the indigent than it does at those who are better off. These facts therefore take on an appalling significance which rather gives the lie to some of our national pretensions.

You often hear the boast that this country does not have one law for the rich and another for the poor, but that all stand alike before the bar of justice. Some of the more roseate discussions on the state of the nation's health carry the assurance that in this country all men likewise stand equal before the science of medicine. In this latter claim, however, certain bits of sophistry may be detected which do not square with all that the data have to say.

The hospital situation is not so simple that it may be dismissed with a wave of the hand and some pleasant generalities to the effect that everyone lives within 30 miles of a hospital, that no one is actually going without care who needs it, that there are plenty of hospital facilities to accommodate everyone who has an ache or a pain. You cannot dismiss basic social and economic inequalities and their results by such offhand pronouncements—it is ineffectual talk to do so, and this is no subject on which to talk ineffectually. I hope the facts presented to you have appealed to your sense of realism and will assist you in dealing with the hospital situation in plain terms.

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Incubators for Premature Infants*

ETHEL C. DUNHAM, M.D., H. C. DICKINSON, PH.D., GRACE J. GOWENS, AND JUANITA WITTERS

Consultant in Pediatrics, Children's Bureau, U. S. Department of Labor; Chief, Division of Heat and Power, National Bureau of Standards, U. S. Department of Commerce; Junior Physicist, Children's Bureau, U. S. Department of Labor; and Junior Physicist, Children's Bureau, U. S. Department of Labor, Washington, D. C.

THE premature infant's need for special provisions for regulation of body temperature has long been recognized. To meet this need a "hatching cradle" was devised in France nearly a hundred years ago, and in the intervening years other types of warm beds and incubators have been developed. The modern types of incubators do not differ greatly in general principles of construction from the earlier types. Advances have, of course, been made in mechanical operating devices, chiefly in connection with the use of electricity.

The clinician who contemplates the purchase of an incubator wishes to obtain one that will maintain the body temperature of the premature infant at the point that he considers "optimum." Some clinicians will wish also to have a type that will regulate the relative humidity of the air within the incubator, and some wish to be able to increase the oxygen content.

A large number of incubators are available at the present time, which vary widely in type, construction, size, price, and method of operation.

When one is confronted with the problem of selecting an incubator, the only guides available are clinical experience and the claims made, and in some instances published, by the makers. Search of the medical literature has not revealed any clinical studies of the relative advantages of different types of beds.

Numerous requests have been received at the Children's Bureau for information in regard to the types of incubators available and their comparative effectiveness. It became obvious that studies should be made, including:

1. Testing of the mechanical construction and performance of incubators in relation to the claims of the makers and to clinical requirements.
2. Use of the results of these tests in the development of standards for construction and performance of incubators to meet requirements for safety and convenience.
3. Clinical testing of incubators under carefully controlled conditions.

A study of incubators was begun in April, 1940, in coöperation with the National Bureau of Standards. In so far as possible with the material at hand in a relatively brief period of study, this paper is reporting upon the first two of the items named above; the third item, clinical testing of incubators under carefully controlled conditions, has not yet been studied.

* Read before the Maternal and Child Health Section of the American Public Health Association at the Sixty-ninth Annual Meeting in Detroit, Mich., October 9, 1940.

MATERIAL AND METHOD OF STUDY

Tests of 12 electrically heated incubators, loaned for testing by 9 different makers, were carried out in the laboratories of the National Bureau of Standards. Differences in construction in the incubators make it necessary to classify them in 3 main groups as follows:

1. The first group consisted of 4 self-air-conditioned closed incubators; 2 of these were bottomless boxes to be used on a crib or mattress, and the other 2 were completely enclosed units, 1 providing gravity ventilation and the other having a motor and fan for ventilation and devices for air cooling and for administration of oxygen.
2. The second group consisted of 4 hooded metal boxes; 2 of these were semihooded, and 2 were water-jacketed, with the top partly covered and with a canopy over the open head end. Each of the latter 2 had in addition a special cover, to be used when oxygen is administered.
3. The third group consisted of 4 cribs with metal-casing sides and open tops.

The tests for performance were carried out in an air-conditioned laboratory in which the relative humidity was about 30 per cent at temperatures of about 72° F. and 82° F. In addition to tests made under these conditions, one incubator that provided by the use of ice for reduction of temperature and of relative humidity was tested in a room environment of approximately 90° F. and 60 per cent relative humidity.

Time will not permit complete description of the technics of the various tests, but mention will be made of those that may be of interest to an audience not primarily interested in physics and engineering. For example, readings of temperatures were made in 12 different places (parts of the beds and in the room) within a 5 minute period, by means of resistance thermometers accurate to 0.2° F. To determine the relative humidity within the incubators that provided for humidity control, thermocouples with wet and dry junctions were used, making it possible to take frequent observations that were accurate to within 2 per cent in absolute value.

The ventilation within the incubators was examined by 3 methods: (1) measurements of air movements with an anemometer having a range of 5 to 150 ft. per minute; (2) observations of smoke patterns so as to trace air currents; and (3) gas analyses of the incubator atmosphere. These analyses were made at regular intervals after the closed incubator had been flooded with oxygen.

During some of the tests two hollow copper cylinders covered with cloth served as proxies for infants. Internal electric heaters provided controllable energy output. Water containers with wicks produced the amount of moisture calculated for an infant of given surface area. An infant weighing approximately 2 kg. was thus represented in relation to surface area, energy output, and amount of moisture evaporated.

RESULTS OF TESTS

Each maker will be sent complete details of the results of the tests of the incubators made by him. A brief summary of the results of the tests follows:

The tests were made with the general axioms in mind that a bed for a premature infant should be so constructed: (1) that the infant can be readily observed at all times; (2) that there is space above the mattress adequate to accommodate an infant weighing at least 6 lbs., exclusive of space for equipment (such as mattress or pad, thermometer, thermostat, and humidistat and in some instances heating lamps); (3) that the incubator design include mechanically reliable provisions for rolling, tilting, or standing, as may be needed; and (4) that for the infant's safety the incubator provide for ease in maintenance of sanitary standards, prevention of excessively high temperature, undue change in environment during

servicing, useful pilot lights, and adequate ventilation.

Visibility of the infant is a serious problem only in incubators of the bottomless box type, in those that are more than semihooded, and in those that are completely enclosed. Each of the 2 bottomless boxes that were tested had a top almost entirely of transparent material, which gave satisfactory visibility when set at a reasonable height. In the more than semihooded incubators, opaque tops and canopies seriously interfered with observation of the infant. On 1 incubator the oxygen top was provided with too small a window, but on the other the window was completely satisfactory. The design of each of the 2 completely enclosed incubators resulted in the tops being at or above the eye level of a seated attendant. One of these incubators was provided with a window in the side and an opening in the top, both of which, however, were too small for an entirely satisfactory view of the infant; the other was provided with an ample window in the top but none in the sides.

The space provided for the infant varied considerably in the different incubators. One of the incubators, a bottomless box, was both too short (18¼ in.) and too narrow (9½ in.) to accommodate a 6 lb. infant. Another had a clearance of only 7 in. to its oxygen top. Each of the other 10 incubators would accommodate a mature new-born infant.

The 8 incubators that had bases or legs were found to be well braced where needed and to stand firmly. Two of these were without casters, and therefore difficult to move; 6 had smooth-rolling casters. Four were designed to be tilted, and in 3 of these the tilting mechanism was satisfactory. The 2 bottomless boxes were light in weight and so could be easily moved; the 2 semihooded incubators without bases were provided with small handles at both ends but were a heavy and awkward load for one person.

The ease with which incubators can be cleaned depends on the finish and on the nature of the design. Two of the 12 incubators were made of enameled wood; 10 were made of sheet or cast metal and were metal plated or enameled. The metal mattress holders were designed for removal and thus cleaning is made easy.

All 12 incubators were electrically heated, by strip heaters, coils, or bulbs; only 1 of them had provision for non-electric heating. All but 1 were provided with thermostats. For 6 of the incubators provided with thermostats the mechanism for setting the thermostat was easily adjustable by dial or by lever and scale; for 3, it was not readily adjusted; for 1, it could be adjusted slightly; for 1, it could not be adjusted but the heater was provided with switches; the 12th incubator was operated by a rheostat. Only 3 of the incubators had master thermostats to limit the maximum temperature.

Fourteen thermometers were furnished with 11 of the 12 incubators, few of which were of a satisfactory type: 8 were red-liquid-in-glass, 2 were dial-and-pointer, 4 were mercury-in-glass. The thermometers from 10 incubators were tested at 2 different temperatures. One incubator was provided with a thermometer that was of such poor construction that it could not be tested. Of the 13 thermometers tested all but 1 had an error of less than 1 scale division, equivalent to 2° F. In some of the incubators, measurement of the temperature at the center of the upper surface of the mattress and above the head end showed differences of 18° and 12° F., respectively, from the temperature indicated by the incubator thermometer at the place where that thermometer was located. In the majority of the incubators these temperatures were within 5° F. of each other.

Some type of water reservoir to increase relative humidity was provided for in 5 of the 12 incubators. In all 4 of the completely enclosed types of incubators, these reservoirs were effective in maintaining a relative humidity of at least 50 to 60 per cent when the relative humidity of the room was about 30 per cent at either 72° or 82° F. One incubator only was designed so that ice could be used to lower the temperature and the relative humidity when indicated. All 4 incubators were provided with hygrometers, of which 1 was also a humidistat. Three of the hygrometers were tested for at least 2 scale points, 1 gave indications 15 per cent too high, 1, 25 per cent too low; 1, consisting of wet-and-dry bulb thermometers, gave values correct within 10 per cent; the 4th, the humidistat, allowed a fluctuation of 15 per cent or more.

One or more pilot lights were provided on 8 of the 12 incubators; in 3 others, the heater itself, a glowing-filament bulb, was visible to give evidence of the operation of the incubator; in 1, there was no provision made for a warning light. In 2 incubators a pilot light went off and on with the heater. In the other 9, the pilot showed only that the main-line switch was closed. In no case were the pilots arranged to show both that the main-line switch was closed and that the heater was operating. Two incubators were equipped with one pilot to give warning if the water supply became low and another to give warning if the water in the drip pan became too deep; and 1 of these was equipped also to give pilot light warning of ventilation impairment.

The 2 water-jacketed incubators were provided with oxygen tops, including oxygen-air mixing valves. Only 1 of these mixing valves provided the percentage of oxygen indicated for the several possible valve settings. The bottomless boxes could not safely be flooded with oxygen on account of the presence of sparking switches and unprotected lamp bulbs. One of the completely enclosed incubators provided a rather crude but sufficiently accurate flow-meter as well as completely safe electrical equipment. The other enclosed incubator contained a small port for the insertion of a tube for administering oxygen but also included a dangerous sparking switch.

All 12 incubators showed a satisfactorily small temperature fluctuation (less than 2° F.) in stable room conditions. Six showed a temperature variation of about 2° F. in different places on the surface of the mattress; 5, of 5 to 10° F.; and 1, as much as 20° F.

Air circulation tests were conducted on the 6 enclosed or nearly enclosed incubators. One of the incubators, a bottomless box, was found to have much less satisfactory ventilation than the others. Air speeds of 10 to 25 ft. per minute were found in the 1 incubator equipped with a motor-driven circulating fan; less air speed in the other 5 incubators.

SUMMARY

On the basis of the performance of the 12 incubators we have drawn up tentative specifications. It is expected that changes in these specifications will be made as improvement takes place in design and construction of incubators and as results of clinical tests become available.

It is hoped that these tentative specifications will be useful to the makers of incubators in suggesting defects in their present product and possible lines of improvement and that they will be equally useful to potential purchasers as a basis for selection of the incubators that are best suited to their needs.

These tentative specifications are available in mimeographed form.

TENTATIVE SPECIFICATIONS FOR INCUBATORS FOR PREMATURE INFANTS

Prepared by

National Bureau of Standards, U. S. Department of Commerce
and
Children's Bureau, U. S. Department of Labor

I. *Material*

a. The frame, base, supports, legs, hood, case, and mattress holder of the incubator shall be of metal, wood, wood substitute, organic plastic, or other suitable material that does not warp, shrink, swell, buckle, age, or fatigue unduly under operating conditions.

b. Windows shall be of shatterproof glass or other shatterproof, noninflammable, transparent material.

c. Water containers shall be made of nonrusting material.

d. The finish of the incubator and of any mattress holder shall be of metal, metal plate, or enamel, sufficiently smooth, hard, and durable to permit thorough and repeated cleaning.

II. *Size*

a. The dimensions shall be sufficient to house the necessary equipment, with a clear space directly above the mattress of at least 23 in. in length, 13 in. in width, and 9 in. in height.

b. Any mattress holder, or space for a mattress, shall be at least large enough to accommodate a mattress 23 in. in length and 13 in. in width.

Note 1. It is suggested that any mattress provided for use in or with an incubator should have an upper surface which is substantially a plane. No point on the upper surface shall be more than ½ inch below a straight edge laid on the upper surface of the mattress in any direction.

III. *Mechanical Design*

a. The incubator shall be constructed with such openings or windows in the top and sides as may be needed to afford at all times a clear view of the full length of the infant's face and the upper part of his chest by an attendant, whether sitting or standing, near the incubator.

b. The type of incubator that is completely enclosed or more than semienclosed shall be provided with suitable doors, sliding windows, ports, or other openings, to permit convenient servicing of the infant without undue change in environmental conditions.

c. The type of incubator that is a closed box or semihooded box designed to be set on a table, bench, or auxiliary base shall be provided, at opposite ends or sides, with a suitable type of handle in sufficient number to accommodate comfortably two hands at each end or at each side. These handles shall be of sufficient strength and so attached to the incubator as to sustain safely the weight of the entire incubator, necessary equipment, mattress, bedding, and an infant 6 lbs. in weight.

Note 2. It is suggested that the type of completely enclosed incubator or more than semienclosed incubator that stands on the floor and is designed to be rolled, shifted, or moved should be equipped with at least one handle at either end to facilitate handling.

d. The type of incubator that stands on the floor shall be equipped with a base, a stand, or well braced legs, so spaced as to occupy an area of floor not less than 13 in. in width and 23 in. in length.

e. The type of incubator that stands on the floor and is designed to be rolled, shifted, or moved shall be equipped with a sufficient number of freely rolling casters or wheels, with tires of rubber, rubber substitute, or suitable composition, the diameter of each caster or wheel, including the tire, to be at least 2 in.

Note 3. It is suggested that freely rolling wheels may require a brake as a safety precaution.

f. The type of incubator that is designed to permit tilting of the upper part of the incubator without movement of the base, stand, or legs shall have a pivot axis across the center, with a clamp and guide at one end. The clamping handle shall be placed sufficiently high to permit the attendant to reach it without stooping.

g. Water jackets, water tanks, and reservoirs shall be so constructed as to be readily cleaned, filled, and drained completely. They shall be equipped with a pilot light, warning light, protected water gauge, or other device, of such design as to facilitate the maintenance of an adequate supply of water. Water jackets shall be provided with suitable air vents to permit ease in filling and draining.

h. The type of incubator that contains a water-jacketed compartment for the infant shall be provided with some means of preventing accidental flooding of the compartment.

i. The types of incubators that are completely enclosed or are more than

semihooded shall provide a system of ventilation that includes air inlets and outlets, motor driven fans, or other necessary equipment or design that will enable the incubator to fulfil the following requirements, when the air temperature in the infant compartment does not differ from room temperature by more than 10° F.: The incubator shall be flooded with oxygen to not less than 50 per cent *excess* oxygen (above normal) and then allowed to diffuse out by means of the normal operation of the ventilating system. Samples of the atmosphere in the infant compartment shall be tested at sufficiently frequent intervals to give a smooth curve for the return to usual atmospheric conditions. From this curve it shall be shown that the decrease from 40 per cent excess oxygen to 20 per cent excess oxygen takes place in not more than 10 minutes; or the result of an equivalent test, involving some other appropriate gas or material, shall show a decrease from 40 per cent excess to 20 per cent excess above usual atmospheric conditions within 10 minutes.

IV. *Electrical Equipment*

a. All metal incubators shall be provided with means for completing a ground connection to the case.

b. A rubber covered or similarly well insulated waterproof cable or cord, at least 6 ft. long, having characteristics appropriate to the heater load, and with a standard prong-type plug, shall be attached to the incubator.

c. All wires leading from the main-line switch to the heaters and other electrical equipment of the incubator shall be well insulated and fixed in position.

Note 4. It is suggested that the quality of the electrical equipment and wiring conform to the best practice as approved by the Underwriters, to guard against fire hazards.

d. A main-line switch shall be provided on the outside of the incubator at a convenient height. "On" and "off" positions of this switch shall be clearly marked. In addition, a pilot light shall glow in a conspicuous location whenever the cord or cable is attached to a proper electrical power supply and the main-line switch is in the "on" position.

e. There shall be a clear indication of the proper voltage to be used, of whether current is direct or alternating, and of any other information essential to the proper choice of power supply. This information shall be posted on the incubator near the main-line switch.

f. In any incubator designed for use with oxygen there shall be complete elimination of all sparking switches, sparking contacts, glowing coils, unprotected lamp bulbs, or like hazardous equipment. If any of this hazardous equipment is included in an incubator, a proper notice shall be conspicuously posted on the incubator to warn against use of that incubator with oxygen, or near an oxygen tent, or in or near an oxygen-rich or ether-rich atmosphere, or any other inflammable atmosphere.

V. *Temperature and Humidity Regulation*

a. The heater shall be of such a size, power output, and location in the incubator as to provide, with the help of any necessary controls, a top surface mattress temperature of as little as 5° F. above room temperature and also up to at least 15° F. above room temperature. To measure the top mattress surface temperature thermometers shall be placed on the mattress in thermal equilibrium with their surroundings and shall be covered with a 90 to 100 per cent wool blanket about ⅛ in. in thickness or weighing about ¾ oz. per sq. ft. The incubator heating system shall maintain a top surface mattress temperature such that thermometers, placed as described above, shall not differ in temperature from one another by more than 5° F. over a central area of 10 by 20 in. and shall fluctuate not more than 2° F. during operation at a given setting of the controls during room temperature fluctuations of as much as 10° F. in 6 hours. In the completely enclosed types of incubators the same limitations as to fluctuations shall apply also to the air temperature from 2 in. to 6 in. about and above the infant.

b. One or more pilot lights shall be arranged either to show proper operation of the heater, or to give warning of failure of the heater, or both.

c. A reliable and properly calibrated thermometer shall be so placed that its temperature is closely related to the mattress temperature. The enclosed, semihooded, and more than semihooded incubators shall in addition be provided with a reliable and

properly calibrated thermometer so placed as to indicate the temperature of the air surrounding the infant.

d. One or more thermostats as needed shall be so located as to insure compliance with the above limitations as to uniformity and fluctuation of mattress and air temperatures. These thermostats shall be adjustable without necessitating disturbance of the infant.

e. In addition, a master thermostat shall be provided to open a main-line switch when either air or mattress temperature shall rise above a temperature of 101° F.

Note 5. It is suggested that a desirable development might be the location of some type of thermometer and thermostat within the space occupied by the mattress and near the infant to decrease the difference between the conditions immediately surrounding the infant and those surrounding the thermometers and control devices.

f. No thermostat, switch, or fluid device shall be so designed or located that its proper operation would be impaired by a longitudinal tilting of the incubator of as much as 15° from the horizontal, excepting on incubators that tilt the mattress holder only.

g. A hygrometer shall be provided with any incubator that attempts to increase the absolute humidity near the infant above that which obtains in the room, the indications of which shall not differ from the relative humidity near the infant by more than 10 per cent in absolute value.

Note 6. It is suggested that the more elaborate completely enclosed incubators should provide suitable means, such as ice, for controlling the temperature and the absolute humidity separately below room values.

VI. *Oxygen-Therapy Equipment*

Note 7. Some models of incubators are designed to permit the introduction of a continuous or automatically controlled oxygen-rich atmosphere. It is urged that all such arrangements and devices be safeguarded as far as possible against an excess of oxygen above the intended value.

a. Any air-oxygen mixing valve shall be calibrated to show the resulting percentage of oxygen in the mixture in the incubator under operating conditions. Notice of the proper oxygen flow to be used with the calibration of the valve shall be clearly posted on the valve or the incubator. In any incubator that is to be flooded with an oxygen-rich atmosphere one or more suitable warning devices or indicators shall be arranged to show excess oxygen and failure of oxygen flow.

b. Any incubator that is to be flooded with an oxygen-rich atmosphere shall be provided with a suitably located vent, through which test samples may be obtained.

c. Any incubator that is to be flooded with an oxygen-rich atmosphere shall provide a suitable means for maintaining a satisfactory relative humidity.

Renaissance of Industrial Hygiene*

C. D. SELBY, M.D., F.A.P.H.A.

General Motors Corporation, Detroit, Mich.

FOR the purposes of this address, industrial hygiene is defined as the science of health in all of its relationships to employment, and it is deemed to comprise the functions of industrial medicine as well as industrial hygiene and the allied professions of engineering and chemistry, in so far as they are concerned with the health of the industrial worker.

The title refers to the changes now occurring in the field of industrial hygiene as defined. These are characterized broadly by modifications in the employer's motive for furnishing health maintenance programs and the attitude of the general medical profession toward those programs and the physicians and allied professions participating in them.

The important features of these changes are:

1. Recognition of the fact that the workmen must be the primary beneficiaries, and that the maintenance of their health must be the principal objective.
2. Appreciation of the equally important fact that the benefits to industry are sufficiently cogent to justify the active interest of management.
3. Development of a rivalry entirely wholesome in character among the professions concerned.
4. Assumption of a public health viewpoint by those who serve in the health departments of industry, and adoption by them of the methods of preventive medicine.
5. An awakening in the medical profession to opportunities in ethically managed industrial health programs, and an elevation of industrial health to a higher level of respect as a specialty in the science and practice of medicine.
6. Extension of industrial hygiene activities in governmental agencies, especially noticeable at the state level.
7. Recognition of the necessity of employing industrial hygiene procedures in developing an effective national defense.

WORKERS ARE PRIMARY BENEFICIARIES

It is not necessary to remind this audience that medical service in industry was originally employed for the treatment of injuries. The service was emergent in nature. It was regarded by industry very much as a railroad would regard a wrecking crew—something to clear away the wreckage—and as such it was not in high esteem, merely tolerated.

By virtue of the Compensation Acts for occupational injuries, the accident prevention movement, the introduction of the physical examination (which admittedly was first used for the purpose of protecting industry against glaring compensation risks), and more recently the enactment of the occupational disease compensation laws, industrial traumatic surgery has evolved into industrial hygiene, and with this evolution has come recognition of the fact that the best approach to an industrial health

* Chairman's Address delivered before the Industrial Hygiene Section of the American Public Health Association at the Sixty-ninth Annual Meeting in Detroit, Mich., October 8, 1940.

program rests in a sincere desire to benefit the workmen rather than solely for the purpose of protecting the employer.

The object is to assist the workmen in so far as is practical in avoiding the disabilities of ordinary sickness as well as the disabilities of occupation. To be wholly effective, such a program must coincide with their interests, and all who serve them in relation to the program must do so with unquestioned honesty and fairness. In recognizing this fact, management no longer expects or wishes biased opinions from its physicians in disputed compensation claims. Facts, and a fair expression of judgment in the interpretation of them, are what management desires. This permits industry to obtain the services of competent physicians and industrial hygienists who are interested in the scientific and humanitarian aspects of industrial health, and are capable of applying them in the solution of the health problems of industry.

INDUSTRIAL HYGIENE BENEFITS INDUSTRY

Sound managements, ever alert to the necessity of profitable enterprise, do not wish their medical departments to become overly expensive, and in their expansions of health service they proceed with some justified caution. Fortunately, however, as medical departments are coming more and more to operate on an employee-service basis, managements are more willing to allow larger appropriations for capital expenditures and a higher annual employee per capita for operating expense. This can be interpreted only as meaning the assignment of greater importance to medical service in industry by management. It is an acknowledgment of the value of the contributions which a good industrial health service can make to labor relationships and efficient plant operation.

RIVALRY DEVELOPS IN THE PROFESSIONS CONCERNED

In the meantime, industrial hygiene engineers have proved their worth. Although their efforts have been directly concerned with engineering methods for the protection of workers against occupational diseases, their recommendations have frequently resulted in a more effective and economic production, which is always welcome in industry.

Their status now is that of a relatively new profession which is finding success, and naturally there is some rivalry among the medical profession and industrial hygienists, and among groups of the latter themselves, for the position of leadership. This is to be regarded as a thoroughly wholesome competition, the outcome of which will be further accomplishments in the field of industrial health—and these accomplishments will decide the outcome. There is no cause for concern in such wholesome rivalry.

PUBLIC HEALTH VIEWPOINT SPREADS

An important change, perhaps the most fundamental and consequently the most important, is in the growing influence of public health on the trends of medical departments in industry.

Witness the interest in the engineering methods of industrial hygiene, the health examinations of workers, studies in sickness absenteeism, and the tuberculosis, syphilis, and other disease control programs in industry.

Because this viewpoint is essentially that of disease prevention, about which there is no controversy, it is acceptable to all parties who are directly or indirectly concerned—the workmen who are primarily benefited, employers who profit by the reductions of lost time and improvements in efficiency, the medical profession whose rights are conserved, and the public, whose general level of health is raised. In this

may be found the real basis of the renaissance in industrial hygiene.

AWAKENING OF THE MEDICAL PROFESSION

With this change of viewpoint from traumatic surgery to health maintenance, came the creation of the Council on Industrial Health of the American Medical Association, which was quick to appreciate the greater abundance of opportunities for the ethical practice of medicine in industry and the large segment of industry yet available to the general practitioners of medicine for service of a profitable nature.

The great need of industry is in this large segment, and something like 85 per cent of all industrial workers are involved. The Council offers the following practical program for the guidance of general practitioners in meeting their obligations with respect to this problem:

1. Train physicians to recognize and report occupational disease.
2. Train industry and labor to the value of industrial health conservation.
3. Elevate medical relations and standards under workmen's compensation.
4. Scrutinize all social legislation affecting industrial health.
5. Clarify relationships between industrial and private practitioners.
6. Improve relations between physicians and insurance.
7. Establish working relationships with all state agencies interested in industrial health.

The Council gives promise of being enormously helpful to the workers, the managements, the medical profession itself, by preparing the profession to meet this great need; and there are indications of its ability to do so.

OFFICIAL HEALTH AGENCIES ADOPT INDUSTRIAL HYGIENE METHODS

Thirty-one states now have industrial hygiene bureaus. Some states have branch laboratories in important industrial centers.

This conception was indeed an inspiration. Industry is expected to supply safe places of employment and healthful working conditions. To comply with these expectations industry needs and requires the assistance of those who have specialized knowledge in the maintenance of industrial health —physicians trained in the medical needs of industry, hygienists, engineers, and nurses. The larger manufacturing establishment can employ this trained personnel. The smaller establishments which employ 62 per cent of the workers, must look to outside sources for this aid—the general medical profession, consulting laboratories, and state industrial hygiene bureaus. And these state and local bureaus meet this need.

THE NATIONAL DEFENSE

In times of national emergency when the call to arms becomes imperative, we realize the supreme importance of the military forces, and all essential resources are placed at their disposal.

Nevertheless, we must not overlook the health of the workers who produce the munitions of defense, for in their conditions of health, to a considerable degree, rest their ability to produce.

On September 16, Surgeon General Parran convened a conference of State and Territorial Health Officers for consideration of the health problems which experience assures us will arise out of the mobilization and equipment of the draftees. During the conference, the Division of Industrial Hygiene of the U. S. Public Health Service presented its program for the maintenance of health in the industries essential to national defense.

This program recognizes the soundness of the industrial health maintenance program which has evolved out of the experience of recent years, and seeks only to strengthen it in those respects found necessary to national defense purposes.

The keynote of the report was sounded in the following statement:

"No matter what the job is, we know it can be done safely, provided we utilize the knowledge already developed in the field of industrial health."

The report stressed the importance of securing coöperation from all government, state, and local official agencies, and volunteer organizations, some of which have already made their contributions, others of which are proceeding rapidly with the development of theirs. The program seemingly is planned particularly for the purpose of strengthening industrial hygiene services of the various states.

This discussion further stated:

In planning a state program for industrial hygiene services it is not necessary to go beyond present-day practice. We are not recommending that the states improvise a program with the idea that the entire program will be abandoned at the end of the present emergency. On the contrary, the program which the Service is recommending to the various state industrial hygiene units is the type of program which should be taken to integrate the industrial hygiene activities with the other activities in the state department of health, such as coöperative efforts with the venereal disease division for the control of venereal disease among workers, and similar arrangements with the division of tuberculosis for the control of tuberculosis among workers. Coöperative programs could also be developed with the division of epidemiology, division of sanitary engineering, division of public health nursing, and the division of dental hygiene. In other words, an effort should be made to bring all adult health services directly to the worker at his place of employment.

It goes without saying that coöperation should be obtained from such agencies as the state medical society committees on medical preparedness and the committee on industrial hygiene, the local university's medical and engineering schools, organized industry, organized labor, members of the industrial physicians and surgeons, the state labor department, industrial commission, the regional director of the U. S. Department of Labor's Committee on the Conservation of Manpower in Industry, the state safety council, nursing societies, the state dental society, and, especially, the various divisions within the health department itself. The nursing bureau of the state health department could be very helpful in such activities and in rendering consultation services to the plant nurses. It is extremely important that the private practitioners be reached through the state medical societies, in view of the fact that recent studies made by us indicate that *85 per cent of the workers in American industry do not have full-time medical supervision in the plants.*

The program is very practical. The main task is to evaluate quickly the important hazards to health in a plant and immediately give specific and practical recommendations to management for the elimination of the hazards encountered. Briefly, the program may be divided into five categories:

1. The investigation and control of specific industrial hazards. Some of the industrial hazards to be investigated and controlled are: Exposure to dusts, fumes, gases, vapors, mists, defective illumination, ventilation, noise, excessive temperatures and humidities, abnormal pressures and posture.

2. Advice to industry and others on the location of new plants and on the renovation of old plants, in the interest of safety and health.

3. The promotion of physical examinations and medical services by industry.

4. The preparation and dissemination of information on various toxic materials and processes, including approved designs of exhaust systems for the control and elimination of atmospheric contaminants.

5. The promotion of measures for the control of syphilis, tuberculosis, and other communicable diseases among industrial workers.

The discussion closed with emphasis on the following salient points:

1. We must not forfeit the gains that have been made in the past 5 years for the sake of expediency.

2. We have created an industrial hygiene program in the nation not as an emergency improvisation, but as an integral part of our national life in the future.

3. Industry is cognizant of the fact that it pays to control and prevent industrial health hazards.

4. Labor is sufficiently well informed, organized, and articulate to demand safer and more healthful working conditions.

5. We have at hand the tools and the information necessary for creating healthful working conditions and for improving the health of our workers.

6. There is no longer any question as to the importance of industrial hygiene and whether or not such services are to be given to the public.

In order to accomplish the objectives of the program, an elaborate system for the training of medical and other personnel for service in industry is necessary. Present plans contemplate a formulation of training programs and the establishment of training centers in designated institutions of learning, where trainees will receive from 3 to 9 months of training, depending upon their previous preparation. This training will comprise laboratory work and practical field work in industrial hygiene, as well as actual experience in the medical departments of industry.

SUMMARY

To those of us who served in industrial hygiene during the World War, this national defense program is very pleasing. Culminating as it does out of the last 20 or more years of research and experience, it demonstrates vast progress; and doubly pleasing is the ever-widening accomplishments of the public health viewpoint.

We are convinced that we are now on safe ground, that industrial hygiene has demonstrated its humanitarian and utilitarian values, and that more than ever before we can expect full coöperation of all parties concerned.

Air Contaminants Papers Available

THE following papers, presented at the second session of the Industrial Hygiene Section of the American Public Health Association, at the Sixty-Eighth Annual meeting in Pittsburgh, Pa., on October 19, 1939, as part of the "Symposium on Field Methods for Rapid Determination of Air Contaminants," are available as separates free of charge, as long as the supply lasts.

Vapors and Their Routine Measurement. By Philip Drinker.

Rapid Methods for the Determination of Gases in the Air. By F. A. Patty. Discussion by L. B. Berger.

Rapid Methods for the Estimation of Air Dustiness. By Helmuth H. Schrenk, Ph.D. Discussion by C. J. Urban.

They appeared in the September and October, 1940, issues of the *American Journal of Public Health.*

Address requests for copies to the American Public Health Association, 1790 Broadway, New York, N. Y.

Use of Miniature X-Ray Films in Tuberculosis Case Finding*

BRUCE H. DOUGLAS, M.D., F.A.P.H.A., CARL C. BIRKELO, M.D., GAIUS E. HARMON, M.D., F.A.P.H.A., AND HENRY F. VAUGHAN, DR.P.H., F.A.P.H.A.

Tuberculosis Controller; Roentgenologist; Medical Statistician; and Commissioner of Health, Department of Health, Detroit, Mich.

AS the program for the control of tuberculosis grows in intensity it becomes more and more apparent that the finding of cases is fundamental in preventing the spread of this communicable disease. With the sources of bovine infection cut to a small fraction of their previous importance, the human cases remain the chief sources of infection with the tubercle bacillus.

It is readily appreciated, however, that tuberculosis is insidious in its onset, either starting with no symptoms of note at all or with acute or subacute symptoms suggesting for some time some more or less harmless condition such as a common cold. Since this is true, waiting for the patient to present himself because he considers himself seriously ill means that the disease has usually developed well beyond the early stage, making it difficult to treat, and requiring a much longer period for recovery, if indeed recovery is possible, than would be the case had it been detected early. Add to this the fact that during this period of progression of the disease the patient has been a menace as a spreader of infection to those about him, there is ample reason to stress the importance of finding the cases, and finding them early.

The methods employed for detecting early tuberculosis have been variously worked out in different places. The value of pooling experiences for the good of all prompts this report on the results of case finding programs that have been employed by the Detroit Health Department.

As reported recently by Edwards and his coworkers in New York,[1] the mass surveying of large groups in the community may be productive in finding many cases, and is not extravagant if groups are selected in which previous experience has shown a higher than average prevalence of tuberculosis.

Wishing materially to improve the case finding in Detroit, it was decided to undertake a survey program in which the private physicians participated in doing tuberculin tests and x-ray examinations of reactors on an extensive scale. Three groups were examined, namely, contacts to known cases; suspects with symptoms; and finally those residing in areas of high tuberculosis mortality. The details of this program have been reported elsewhere,[2, 3] so it is only necessary now to bring the experience with the method up to date.

*Read before the Epidemiology Section of the American Public Health Association at the Sixty-ninth Annual Meeting in Detroit, Mich., October 9, 1940.

Beginning in January, 1937, a very intensive effort was made. With house-to-house visiting by nurses in high mortality areas it was possible to persuade many persons to go to the private physicians' offices for a tuberculin test. This intensive drive was maintained until May, 1938. May, 1938, to June 30, 1940, the program carried on without nursing visits, since funds were not available to continue such an extensive effort.

During the 3½ years' operation of this plan, 136,812 persons were tuberculin tested and 38,395 reactors, or 29 per cent, were found. Thirty-four thousand and fifty-nine of the reactors were examined by x-ray and 890 new cases requiring treatment were detected.

TABLE 1

Medical Participation in Tuberculosis Case Finding

Tuberculin Tests and X-ray Examinations According to the Period During Which They Were Done

December 3, 1936 – June 30, 1940

	Tuberculin Tests Reported			*X-ray Examinations Reported*	
Six Month Period	*Total*	*Positive*	*Per cent Positive*	*Total*	*Verified Cases Found*
First	41,434	10,010	24.2	7,403	213
Second	33,295	9,565	28.7	8,757	204
Third	40,102	12,228	30.5	10,924	216
Fourth	9,303	2,584	27.8	2,644	97
Fifth	5,264	1,652	31.4	1,848	72
Sixth	4,282	1,340	31.3	1,443	55
Seventh	3,132	1,016	32.4	1,040	33
Total	136,812	38,395	29.0	34,059	890

Cases per 1,000 tuberculin tests	6.50
Cases per 1,000 positive tuberculin tests	23.15
Cases per 1,000 x-ray examinations	26.13

There were approximately 800 physicians who took part in this program.

Because of the visits for testing, revisit for reading, and a visit to another physician often for the x-ray, a good many examinations were not completed. Just how many failed to go for a reading of the test is not known since tests without readings were not reported. There were undoubtedly a good number, however. It is known that only 34,059 of the 38,395 reactors were x-rayed, and this is a loss of 11.3 per cent.

This effort, however, was productive of many minimal cases and was successful in raising the per cent of minimal cases reported in Detroit from 13 per cent for the period just before the start of the program, to 26 per cent for the year 1938 during the height of the campaign.

Since the x-ray examination of the chest is the best means of detecting early pulmonary tuberculosis, it has long been thought desirable to have an inexpensive yet accurate method for making such examination so that it might be used directly as a single procedure, thus avoiding losses due to inaccuracies of a single dose tuberculin test, failure to have the test read, or failure to go for an x-ray examination when the test was found positive.

The fluoroscope, the paper film, and more recently photography of the fluorescent screen image on small film have been employed to meet the requirement of economy.

Dr. Hollis Potter [4] collaborating with the General Electric X-ray Corporation undertook to develop a technic that would produce a film large enough to be interpreted readily without enlargement and yet small enough to provide a real saving in film cost. After extensive experimentation it was found that a photograph of the fluorescent image of 4 x 5 inch size best answered this requirement. For over a year it has been possible to use this equpiment in the Tuberculosis Clinic of the Detroit Health Department in order to determine its usefulness as a case finding tool. During this time various studies have been made to test its practicability.

To produce these 4 x 5 inch films or fluorographs, a special fluorazure screen is employed which is mounted in an

enclosed box, a lead glass plate screens out the x-rays allowing only light rays to pass through the large high speed lens mounted at the tapered end of the box which focuses the light rays onto the small film. This system is adjusted to a fixed focus and no shutter is required since the flash of x-rays is timed to give the proper exposures. The source of x-ray is a 500 milliampere rotating anode tube operated up to 80 kv. The exposures are made for 1/20 to 1/5 second, depending on the thickness of the chest. Satisfactory pictures may be taken by using lower milliamperage equipment with a longer exposure, but the films are not as brilliant as when 400 milliamperes are used.

The first experiment with this equipment which was reported elsewhere [5] was for the purpose of checking its accuracy when compared with the full size film taken with an excellent technic. Accordingly, 1,610 persons were examined with both large and small films and the interpretation of each size made independently. Comparison of these readings indicated an inaccuracy of 2.6 per cent only for the small film in comparison with the large. This small error is not considered of great significance, and the authors are sure it would be much less now with greater familiarity with the small film. In fact, Bridge,[6] making a similar study, found less than 1 per cent error.

These small films can be made very rapidly, at least one per minute. If questionable lesions are found, the patient may be called back for a large film. However, for case finding purposes the diagnosis can be sufficiently well made in most instances on the small film alone to decide whether hospitalization is necessary. In a series of 6,104 consecutive small films, in only 51 instances was it found necessary to recall the patient for a large film, 39 of these to help clear up the diagnosis, and 12 because of poor films.

Because of this very satisfactory record, the miniature film has been adopted for the outpatient service for diagnosis in new admissions to the clinic and for checking of patients discharged from hospitals for follow-up examinations. More than 18,000 such examinations have been made and have been highly satisfactory.

Survey projects for special groups have been undertaken. Since this type of x-ray examination is relatively inexpensive it was felt it could be used directly without previous tuberculin testing which had heretofore been widely used, since the test could readily screen out a large number who would not need the more expensive x-ray examination.

In order to place some value upon this comparison in adults, a survey of the women coming to the prenatal clinics of the Department of Health was undertaken. All were tuberculin tested with a single dose of 1/1,000 O.T. and all were x-rayed. Fourteen hundred and twenty-five women were tested, but 144, or 10 per cent, failed to return for the reading of the test. However, these had been x-rayed, and among these 144 women who might have been missed if tuberculin screening had been used to select for the x-ray examination, there were 2 active pulmonary cases—one moderately advanced and one far advanced. Of the 1,281 women who returned for a reading of the test, 610, or 47.6 per cent, were positive. Among the positives were 3 active cases. Among the 671 negatives there were 2 active cases found by x-ray.

While these numbers are small, still they indicate the possibilities for missed cases in tuberculin surveys through failure to return for the reading of the test and failure to respond to a single dose of tuberculin, all of which is obviated by one visit for an x-ray examination of everyone in the group to be surveyed.

This prenatal group survey has been

continued without further tuberculin testing and altogether 3,122 have been x-rayed and 17 cases found, or 0.5 per cent.

Having had such satisfactory results with the small film, it was decided to undertake a more extensive survey of an area of the city where the mortality from tuberculosis was known to be high. This was extremely timely since the medical participation program for case finding was being discontinued.

A second fluorographic unit was secured and placed in a special clinic in the Brewster Housing Project, which is in the center of an area of some 200,000 population, with a mortality of 127 per 100,000 per year. House-to-house visits by volunteer groups, health guilds, lodge and insurance groups organized for this work by the Health Education Division of the Department of Health are being made to encourage everyone residing in this area to avail himself of this opportunity to be examined.

This clinic can handle up to 300 persons per day when the work gets well under way. During the first 12 weeks 4,815 were examined, and 76 active cases (1.5 per cent) found.

TABLE 2

Clinic in Brewster Housing Project

	Cases Found
Primary active	13
Minimal active	22
Moderately advanced active	15
Far advanced active	17
Pleurisy with effusion	7
Miliary	2
Total	76

In addition, a large number of non-tuberculous conditions were discovered, 204 cardiac lesions and 23 non-tubercular pulmonary lesions, which while not important communicable disease problems for the community still are of great importance to the individual concerned, and their early discovery may in some instances make possible the prevention of more serious involvement.

In comparison with other x-ray methods of examination, the 4 x 5 inch fluorograph appears in a favorable light since:

1. The full size 14 x 17 inch celluloid film is the most accurate, but is far too expensive for widespread use, the 14 x 17 inch film being 10 times as costly as the 4 x 5 inch.
2. Sensitized paper is almost as accurate as full size celluloid film, but it still is quite expensive, being about one-half that of celluloid and in addition is bulky to handle and store.
3. The fluoroscope while quite inexpensive is not nearly so accurate (13 per cent error according to Fellows[7]), and has the disadvantage of not giving a permanent record.
4. The 35 millimeter film taken with a small camera as a photograph of the fluorescent screen image is very inexpensive but sacrifices too much in accuracy. This size must be enlarged again before it can be interpreted.

The authors therefore feel justified in concluding that the 4 x 5 inch fluorograph is:

1. Accurate in comparison with large standard films.
2. Can be used without previous tuberculin screening.
3. Is economical and can be rapidly applied to large numbers for survey purposes.
4. Compares most favorably with other methods of x-ray examination which have been applied to large numbers.

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Method of Measuring the Effectiveness of Preventive Treatment in Reducing Morbidity*

C. A. SARGENT, M.D., AND MARGARET MERRELL, Sc.D.

District State Health Officer, State Department of Health, New York, N. Y.; and Associate in Biostatistics, School of Hygiene and Public Health, Johns Hopkins University, Baltimore, Md.

IN 1935, the senior author of this paper, at that time associated with the Delaware State Health Department, undertook an evaluation of the immunization program against diphtheria which the department had instituted in 1926 and had pursued actively since that date. In the course of this investigation certain difficulties were encountered which are common to all such problems. The solution given to them may be of general interest since the evaluating of its activities is one of the perennial problems of a health department.

The appraisal of the Delaware program was undertaken along the most natural and direct line—that of determining how many of the recorded diphtheria cases were among those who had received the immunizing treatment and how many were not. This necessitated checking the name file of cases against that of persons given the preventive treatment. Since age is such an important factor in the incidence of diphtheria, this fact was recorded also. During the eight years, 1927 through 1934, there were 799 cases of diphtheria between ages 1 and 20. Of these, 90 were located in the file of persons who had been given the preventive treatment. This fact alone tells us that the treatment was not 100 per cent successful in preventing cases — a well known fact—but beyond that it does not go. In order to determine the *degree* of success in case prevention we need to know the attack rates, and therefore the sizes and ages, of the "immunized" and "nonimmunized" populations.

Between the start of the Delaware program and the end of 1934, 62,043 individuals were given a complete preventive treatment. A tabulation of these persons according to the calendar year and age at the time of treatment is given in Table 1. To get a picture of the age distribution of this group at any given date requires bringing up to date the ages of persons previously treated. Since with each successive calendar year the person is a year older, the age distribution on any date of

* Paper from the New York State Health Department and from the Department of Biostatistics, School of Hygiene and Public Health, The Johns Hopkins University, No. 213. Read before the Epidemiology Section of the American Public Health Association at the Sixty-ninth Annual Meeting in Detroit, Mich., October 11, 1940.

† The late Dr. W. H. Frost was primarily responsible for the development of the method described in this paper, and had arranged with the present authors for writing it up for publication.

those previously treated, is obtained by adding the numbers given in Table 1 along the diagonals indicated. This procedure was used to derive the distribution given in the last column of Table 1, of the ages of the 62,043 persons, as of December 31, 1934. A similar tabulation could be made at any other date during the time period.

This tabulation gives us some knowledge of the "immunized" persons, and we need to have similar facts about the "nonimmunized." An attempt was made to derive this information by the natural procedure of subtracting the December 31, 1934, distribution from the estimated total population of these ages for the same date. This attempt promptly exposed a serious fallacy in the method, in that the difference between total population and those treated was too small. In certain age groups this deficiency was very striking, and it was clear that if the same procedure of accumulation was continued over a few more years of time the estimated "immunized" population of a specific age would exceed the total population for that age.

A little consideration shows that the reason for this paradoxical situation is that only a part of the accumulated number treated prior to December 31, 1934, would still be present in Delaware on that date. Some would have died, and more would have migrated from

TABLE 1

Distribution by Age and Calendar Year of Persons Given a Complete Diphtheria Preventive Treatment by the Delaware State Board

Age in Years	1926	1927	1928	1929	1930	1931	1932	1933	1934	Total No. Treated 1926–1934 by Age on Dec. 31, 1934
Under 1	30	36	48	49	162	226	434	721	434	434
1	23	61	70	83	290	348	280	307	538	1,259
2	40	104	111	117	254	356	206	255	443	1,184
3	45	135	153	143	259	359	187	282	375	1,136
4	55	127	190	168	236	392	197	305	410	1,408
5	102	219	300	254	402	456	223	330	569	1,756
6	517	502	1,009	825	858	917	879	610	1,641	2,912
7	551	1,070	922	785	675	760	708	364	1,065	2,772
8	745	1,103	852	777	510	559	377	305	796	3,078
9	650	1,161	840	846	395	399	248	192	599	3,409
10	794	1,256	1,017	818	574	594	212	140	544	3,353
11	652	1,059	701	579	414	308	247	155	362	3,281
12	782	962	819	563	266	143	150	114	314	3,667
13	524	594	744	514	191	127	212	76	164	3,997
14	534	555	771	540	73	192	172	49	112	4,355
15 and over	943	1,470	1,435	1,217	863	299	242	94	144	21,192
Unknown	395	221	513	225	120	485	391	218	66	2,955
Total	7,391	10,641	9,294	8,668	7,451	6,720	5,365	4,517	8,574	62,043

the state. This is a difficulty universally present in any accumulated register of persons recorded for some event in their lives. It is so obvious for certain registered events that we should never think of using the total register of persons up to a certain date as a population of that date. For example, we should never think of using the marriage registrations in a state prior to any date as a count of the married population for that date or, for that matter, the accumulated births as a count of the total population. The reason that the error in using the immunization file in this way is less glaring at the outset is that it has been accumulated for a shorter time and pertains to a population which has a smaller death rate and perhaps a smaller migration rate than the adults. Nevertheless, the error is serious enough to vitiate any comparisons based on such population estimates. Since it has the effect of overestimating the treated and underestimating the untreated population, it exaggerates any reduction of rates associated with the immunization program, and may create an apparent reduction where none has occurred.

It is thus necessary to adopt some other procedure for determining what degree of preventive accomplishment is indicated by the fact that only 90 out of the 799 cases occurring were located in the treatment file. The solution given to this problem was based on the following reasoning: If we could get a representative sample of the population, of each age and for any given date, entirely unassociated with diphtheria, and see how many of them could be located in the file of persons treated prior to that date, we would have a base line for judging the diphtheria figures.

Many ways might be considered for obtaining such a sample, and it is clear that in truly representative samples of the population, obtained by different means, essentially the same proportions (i.e., within sampling variation) of any age class should be located within the diphtheria treatment file.

From the point of view of the health department, a very convenient choice of sample lies in its own records of the reported cases of the common communicable diseases of childhood (exclusive of diphtheria) to which children appear to be universally susceptible. To test the representativity of such a sample in the Delaware study, the cases of measles, scarlet fever, whooping cough, and chicken pox, in successive years, were separately checked against the diphtheria immunization file. Within sampling variation, for any specific age the same proportion of cases of each of these diseases was located in the file. There is thus no reason to suspect these samples of bias, relative to diphtheria immunization (if we reject the improbable hypothesis that they all have just the same bias). We may therefore assume that the proportions of cases of these miscellaneous diseases for any year, found in the immunization file, reflect the *proportions of the population for that year, which have been given the preventive treatment by the state.* To increase the stability of the estimates, the proportions were computed for the 4 diseases combined.

Table 2 gives the age distribution of the cases of these 4 communicable diseases occurring in successive 2 year periods, and the number and percentage of these cases found in the preventive treatment file. These percentages increase over the time period as would be expected with a developing immunization program.

We now have a base line in terms of which we may judge the relation of the diphtheria cases to the preventive treatment. One procedure for obtaining this judgment would be to apply the percentages given in Table 2 to the estimated total populations of these time periods. This would give "immunized"

TABLE 2

Cases of Measles, Scarlet Fever, Whooping Cough, and Chicken Pox, by Age, Delaware, 1927–1934, According to Presence or Absence in Diphtheria Preventive Treatment File

Age	1927–1928			1929–1930			1931–1932			1933–1934		
		In File			In File			In File			In File	
	Total	No.	%	Total	No.	%	Total	No.	%	Total	No.	%
1	71	2	2.8	65	3	4.6	131	18	13.7	153	30	19.6
2	213	9	4.2	192	11	5.7	329	56	17.0	402	96	23.9
3	247	16	6.5	221	17	7.7	424	82	19.3	483	141	29.2
4	243	17	7.0	243	26	10.7	413	88	21.3	428	95	22.2
1–4	774	44	5.7	721	57	7.9	1,297	244	18.8	1,466	362	24.7
5	290	54	18.6	290	46	15.9	548	136	24.8	571	282	49.4
6	351	117	33.3	345	101	29.3	631	253	40.1	728	386	53.0
7	389	122	31.4	392	176	44.9	608	300	49.3	740	416	56.2
8	244	85	34.8	240	127	52.9	450	228	50.7	482	280	58.1
9	173	80	46.2	168	103	61.3	289	167	57.8	297	199	67.0
5–9	1,447	458	31.7	1,435	553	38.5	2,526	1,084	42.9	2,818	1,563	55.5
10–14	474	203	42.8	277	190	68.6	587	459	78.2	516	396	76.7
15–19	86	8	9.3	67	18	26.9	130	49	37.7	142	78	54.9
1–19	2,781	713	25.6	2,500	818	32.7	4,540	1,836	40.4	4,942	2,399	48.5

and "nonimmunized" population estimations which would furnish the denominators for the corresponding case rates. Because of the difficulty of estimating populations by age, particularly in the postcensal period, this method was not used here, although with good population estimates available it would be sound.

Instead of setting up attack rates, the observed diphtheria cases were proportioned "in the treatment file" and "not in the treatment file" according to the proportions for the other diseases

TABLE 3

Cases of Diphtheria by Age, Delaware, 1927–1934, According to Presence or Absence in Diphtheria Preventive Treatment File, Compared with Number Expected from Proportions of Population Estimated to Be in the File

Age	1927–1928			1929–1930			1931–1932			1933–1934			1927–1934		
		No. on File			No. on File			No. on File			No. on File			No. on File	
	Total Cases	Obs.	Exp.	Total Cases	Obs.	Exp.	Total Cases	Obs.	Exp.	Total Cases	Obs.	Exp.	Total Cases	Obs.	Exp.
1	12		0.4	6	..	0.3	9	..	1.2	9	3	1.8	40	5	3.7
2	12		0.5	14	..	0.8	23	..	3.9	17	1	4.1	66	1	9.3
3	16		1.5	20	..	2.3	21	..	4.1	13	..	3.8	82	..	11.4
4	13		1.2	17	..	1.8	19	..	4.0	14	2	3.1	69	2	10.2
1–4	53		3.4	67	..	5.2	72	..	13.2	53	6	12.8	257	6	34.6
5	23		4.3	18	1	2.9	22	2	5.5	16	2	7.9	79	5	20.6
6	33		7.0	33	1	9.7	22	..	8.9	8	2	4.2	84	3	29.7
7	38	1	7.5	18	3	8.1	40	4	19.7	10	3	5.6	79	11	36.9
8	5		3.1	14	1	7.4	22	3	11.2	9	1	5.2	54	5	26.9
9	7		3.2	6	2	5.5	13	1	7.5	8	4	5.4	37	7	21.6
5–9	114	1	25.1	92	8	33.6	119	10	52.7	51	12	28.3	333	31	135.7
10–14	27	1	5.4	37	5	26.5	42	12	32.6	20	8	15.3	121	34	85.5
15–19	23	1	2.1	17	2	4.6	29	10	10.9	19	6	10.4	88	19	28.0
1–19	217	3	35.3	213	15	70.2	262	32	109.6	143	32	66.8	799	90	281.8

(i.e., for the population), and a comparison with the observed figures was then set up. This comparison is presented in Table 3. From this table, it is seen that if the diphtheria cases had been as unassociated with the immunization treatment as were the other diseases, the 799 cases should have been distributed with 282 cases among those given the preventive treatment and 517 among those not treated. Instead, as stated above, only 90 were located in the treatment file while 709 were outside the file. This clearly indicates a considerable success in the prevention program. The degree of success is, in fact, greater than would be indicated by the difference between the 282 "expected" cases and the 90 observed, for the 709 cases among the untreated population would probably have occurred regardless of the preventive treatment accorded the others. If, therefore, 709 can be considered the true expectancy in the untreated group, the expectancy in the treated group should be in the same proportion to 709 as 282 is to 517, or 387 cases. That is, in the absence of preventive treatment we would have expected an increase in the total cases, not merely a redistribution of them in the population. This total expectancy is 1,096 cases, and of the 387 cases which should, according to the population distribution, have occurred among those whom the state treated, 90 did occur. We may thus conclude that the immunizing treatment succeeded in preventing three-fourths of the cases which would otherwise have occurred among those given the treatment.

The method by which this evaluation of the preventive treatment was made is very general. At any time that a name file of persons given treatment is available, and it is possible to check both the cases of the disease and a random sample of the population against this file, a judgment can be made as to the effectiveness of treatment. Even if the immunization file is not complete, the method is applicable, but in that case the success of the preventive treatment will be underestimated due to the inclusion in the "nonimmunized" group of persons who have been treated and are not so listed. This factor is probably always present to some extent because of migration into the state of persons given the preventive treatment elsewhere. The effect of this is to give us conservative estimates of the accomplishment of the state program, and therefore we may consider appraisals made by this method as minimum measures of the success of the preventive treatment.

The Present Status of Public Health Education*

C. V. AKIN, M.D.

Assistant Surgeon General, U. S. Public Health Service, Washington, D. C.

PUBLIC health education has now reached a stage comparable in many respects with the adolescent period in human growth. There are signs of the emergence of a mature personality, capable of accepting and effectively discharging adult responsibilities. There is less dependence upon the immediate control of the family—namely, public health and medical science on the one hand, and education on the other. There is a tendency to adopt, sometimes indiscriminately, the dictates of outside influences; to undertake vast projects which die aborning; and to display, almost in the same breath, astounding maturity of performance and the behavior of infant days. Withal, there is a disposition to do some original thinking, to weigh cause and effect; and to find achievement under wise control. All these things are familiar characteristics of the healthy adolescent; the emerging personality gives evidence of [illegible] emotionally expressing the [illegible] of both parents.

[illegible] health and education, like [illegible] are faced with the necessity of making important decisions. [illegible] introduced into the [illegible] and to what [illegible] [illegible] to bring about [illegible] In answering these questions, the first requirement is that the parents shall resolve their own conflicts and present a united front.

Where this coöperation has been brought about, we see public health education functioning along new lines of service to the entire community. Many official and nonofficial health agencies have joined hands with educational authorities in the development and conduct of public health education programs. Unfortunately, this kind of active, practical coöperation is exercising its beneficent influence in too few organizations.

Public health education has been defined, explored, and discussed by innumerable organizations and individuals over a considerable period. Yet, today, we do not possess sufficient data to permit a satisfactory, objective evaluation of its status. To what extent is health knowledge made available to the public through the various media of information? How are educational programs organized and administered? *What* knowledge is imparted to the public? How effective is health education in terms of providing the public with the knowledge and skills essential to health promotion? We do not have adequate answers to these questions; nor is it likely that we shall ever have complete information, since the scene is constantly shifting, and the factor-

worthy of specific study have as yet proved too numerous for simultaneous consideration.

In recent years, several studies have been made by the Public Health Service, designed to throw light on various facets of educational activities in the health field. The Division of Public Health Methods has explored health education of the public by means of the spoken word, through study of the home visits of public health nurses and sanitarians. In coöperation with the Metropolitan Life Insurance Company, the American Museum of Health, and the International Business Machines Corporation, the health knowledge of some 100,000 members of the general population has been tested at the New York World's Fair and at the Golden Gate Exposition in San Francisco. From an analysis of these tests, health educators may derive much needed definite information on what the public knows, or believes, and what it wants to know about matters of individual and community health.

During the past year, studies have been initiated in the Division of Sanitary Reports and Statistics which have for their purpose the securing of definite information on the educational materials provided for the public by the principal sources of health information. The first of these to be completed is the analysis of 2,500 publications on health subjects which are produced and distributed by 115 organizations. It was felt that careful study of the existing materials might provide a valuable index not only for the improvement of popular health literature and for the wider use of the most effective materials, but also an index to some of the difficulties standing in the way of healthy growth and efficient performance in other educational activities.

A true evaluation of the present status of public health education would require systematic study over a number of months, along numerous lines of investigation, in countless organizations. Nevertheless, the printed materials of official and nonofficial health agencies significantly reflect the total public health education effort, since they constitute our principal record of the information provided for the public by authoritative sources. I shall attempt to outline for you some of the more apparent barriers to effective health education of the public as revealed in our study of the printed word.

These barriers we do not believe to be insurmountable. Moreover, as regards the official agencies whose manifold functions and restricted budgets do not permit of rapid expansion in public health education, it is believed that much improvement in the educational effort could be achieved with little, if any, additional expense.

The 2,500 publications included in our pamphlet collection were contributed by 47 state health agencies, 2 territorial boards of health, 42 city health departments, 18 private organizations, and 6 federal agencies. Although neither the collection of publications nor the organizations represented include all of the materials or all the active health agencies, they are sufficient in quantity and in geographic distribution to be representative of the educational materials from the principal sources of health information in the United States.

One problem, shared to a greater or less extent by all types of organizations, is lack of coördination of the educational activities of the individual agencies. This is true of a far larger proportion of official health agencies than of private organizations. Neither federal, state, nor local official agencies escape this failure to draw together the activities of the organization in behalf of the public's health information. In state health departments and large city agencies, for example, the several divisions, bureaus, or units of the agency prepare, publish, and distribute educa-

tional materials apparently independent of central supervision. Far too frequently, such materials duplicate, overlap, or even contradict one another. In all likelihood, the total educational effort reflects the same lack of integration.

No one is more aware of the existence of this condition in federal agencies than the Division of Sanitary Reports and Statistics. During the past year, however, steps have been taken in the Public Health Service to improve the situation. The production of health educational materials by the Service is now being coördinated in the Division of Sanitary Reports and Statistics, including the preparation of venereal disease education materials. Unnecessary duplication of federal materials in the maternal and child health field has been done away with by withdrawing from publication the pamphlets of the Public Health Service on these subjects, and by referring the public in need of such materials to the Children's Bureau. Again, coöperative arrangements are being developed between the Public Health Service and the U. S. Office of Education and the National Youth Administration. These first steps do not mean that all the problems have been solved, nor that impressive results have as yet been achieved; but at least a beginning has been made.

A striking manifestation of the lack of coördination and of coöperation in educational activities among health agencies is the amazing duplication of pamphlet materials on specific subjects. More than one-fourth of the 2,500 publications in our collection are upon communicable diseases; and another 22 per cent on such impersonal health subjects as environmental sanitation and control, scientific research, organizational problems, and vital statistics. Since these are the paramount interests of public health work, the concentration of effort upon these subjects would not be of particular note were it not for the resulting dearth of materials upon other subjects of increasing public health importance, especially in relation to the health of young adults and older members of the population.

Only 36 pamphlets in the collection could be classified as industrial hygiene materials, and half of these were technical bulletins. Mental hygiene received even less attention, with only 18 publications. Together, these two problems of nation-wide, public importance were discussed in about 2 per cent of the 2,500 pamphlets in our collection.

Non-communicable diseases, including a large proportion of those which are the most frequent causes of death and others which cause a tremendous volume of disability, were discussed in only 1 out of every 16 pamphlets of our collection. For every publication on non-communicable diseases, there are 3 on environmental sanitation and more than 5 on communicable diseases.

Even in publications on communicable diseases, there is an unusual amount of concentration on particular infections. For example, there are more pamphlets on venereal disease than upon any other specific public health problem, and more than twice as many on tuberculosis as on cancer. And there are more than twice as many publications on diphtheria, measles, smallpox, or scarlet fever as upon influenza, pneumonia, or malaria.

Not only is there duplication of subject matter, but the informational effort also tends to view a wide variety of subjects as the health problems of limited groups of the population. At least half of the content in our pamphlet collection is directed toward the problems of expectant mothers, infants, and children under high school age. Even where there is a considerable amount of material on subjects of general interest—as in dental hygiene, nutrition, and personal hygiene—overemphasis upon limited groups of the population tends to weaken the

public health education effort. In dental hygiene, for example, it is difficult to capture the interest of adolescents, young adults, or older persons, by a pamphlet for parents of young children. When dental care ends with the preservation of the 6 year molar, the interest of people worried about their wisdom teeth dies.

In the printed materials of official and nonofficial agencies, we can also see the failure to define clearly the objectives of the health agency's educational program as a whole or the objectives of particular programs.

We are all, I believe, agreed that the ultimate goal of health education is to equip the public with the knowledge, the desire, and the skills needed to protect and promote their health. Immediate objectives have not been clearly defined, however. Is the objective of communicable disease education to help the public avoid these dangers and to meet them in emergency? Or is it to secure the coöperation of the family in the performance of routine control measures, *after* a case has occurred? Is the objective of cancer education to reach and bring to treatment persons with precancerous conditions as well as those who have the disease but who are relying on self-treatment or quackery for their care? Or is it to secure community support for the improvement or expansion of cancer control facilities?

In many ways and in far too many instances, the content of our pamphlets unmistakably indicates that such questions have not been answered in the preparation of educational materials.

Indeed, one cannot help being impressed by the unusual emphasis upon the promotional aspects of public health education as compared with education of the individual. At a seminar for federal informational personnel held in Washington last winter, Professor Charters of Ohio University made this distinction between "informational" activity and "educational" activity, which I believe you will find worthy of consideration.

"Informational" activities he holds to be those which seek to inform the public of the functions, facilities, and accomplishments of a particular agency; "educational" activities, on the other hand, are designed to influence the public to adopt new attitudes and new practices in relation to their own lives. When applied to public health education, the first approach, which is promotional in character, tends to make us think more about ourselves and the things we know than about the needs of the public and the things they want to know.

Both promotional and educational activities are needed to make a well rounded public health education program. Far too often, however, the promotional approach dominates the program. When this happens, we are apt to place more reliance upon publicity technics, and upon the technical and scientific knowledge which interests *us*, than upon the needs of the public as our guides to performance.

There can be but one result under such circumstances—the program is not interpreted in terms of the public's needs and understanding. What we say may not fit in with the public's way of looking at things; and, what is more important, what we say does not suggest the significance of our knowledge in relation to what the public thinks and does, as individual members of their society and their family. Our efforts to secure the public's coöperation and support may fail us because we have failed it.

In our pamphlet collection, these deficiencies are especially apparent both in the dearth of materials on subjects of interest and concern to important groups of the population, and in the way we talk to our public about problems of general interest.

In the first instance, for example, the

standing who are working to obtain agreement on, and to raise, the educational qualifications of professional public health workers. Their work, though sometimes slow, is accomplished through painstaking effort, careful study, and broad consultation.

Self-regulation is not easy in any professional group. On the one side, it raises the fears of those who may suspect themselves of being inadequately trained. On another side, it tends to dissatisfy those with superlative training who believe that all should have similar advantages. In another direction, it dares to assail the academic stronghold of our schools with questions concerning the effectiveness of their training. It must always wrestle with the difficult problem of experience versus training. It must constantly bear in mind the dangers of over-specialization and of over-standardization so well pointed out to our members by the late Dr. Frost. And yet, with all these difficulties self-regulation must depend for any success it may enjoy upon ultimate agreement by a majority of the members of this Association. For these reasons your committee appreciates the opportunity of reporting to you on its activities and its general methods of procedure.

As to general policies, the committee is proceeding on the theory that the best of training is none too good for those who would enter the public health profession in any of its branches. It has prepared reports suggesting rather high standards of training for the various sub-specialties in the field, feeling that these high standards were worthy aims, but recognizing that their complete accomplishment may not be possible at the present time. The committee is in unanimous agreement that its reports must not remain static. They are published from time to time as the consensus of the best knowledge available at the present moment. They are subject to constant review and revision. Their revision depends largely upon the suggestions received from members, upon the comments and directions of the Governing Council, and upon changing demands in the field. The committee recognizes the necessity of patience and tolerance in controversial issues. It recognizes the importance of time in all sound professional growth. The committee hopes to deserve your full confidence, and to assist in crystallizing opinions concerning professional qualifications in this Association. According to the By-laws we are charged with the responsibility of " carrying out research and the development of standards for professional education and training in public health, and the performance of such other functions as may be delegated to it by the Governing Council with the view of maintaining professional qualifications of high standards." To these ends the committee has bent its energies in the past and during the current year.

A brief summary of the year's work is as follows:

Well over a thousand copies of the report dealing with the educational qualifications of health officers, approved by the Governing Council at our last meeting, have been placed in the hands of health officers, medical schools, schools of public health, civil service agencies, foundations, and other interested groups. This was a report of far-reaching importance to the public health profession. It has been reprinted in a number of professional periodicals, and has received widespread favorable editorial comment.

The committee has also distributed large quantities of its other reports, previously approved by the Governing Council, covering the educational qualifications of engineers, sanitarians, industrial nurses, school health educators, public health nurses, and public health statisticians.

A sub-committee has been appointed to study the educational qualifications of public health nutritionists. This committee is working closely with the American Home Economics Association, the American Dietetics Association, and the Conference of State and Territorial Health Officers. The preliminary draft of their report was approved at this meeting and it will be circulated for critical comment in the usual manner before submitting it for approval to the Governing Council.

Careful study has been given to the assistance which the Association may give to health departments introducing and operating the various forms of merit systems. This is a situation in which the federal and state health agencies are seeking to implement the ideals of career service for which the Association has long stood. The precise nature of the assistance we may be able to render is still undetermined, and depends largely upon what we are asked to do by the federal agencies and the various state health departments. It is possible that the committee can help most by preparing a manual of experience in the examination of persons for professional positions in public health, and by systematizing the nomenclature for positions in our professional field. During the year requests from several state authorities for assistance with their respective merit systems have been met, and in several instances lists of able consultants have been prepared. A sub-committee has been appointed to explore this field in order that the assistance of the Association may be as effective as possible.

Consideration has been given to the need for adequate training of administrative personnel in special fields. Our attention has been called to the desirability of providing basic public health education for industrial hygienists, tuberculosis directors, venereal disease officers, public health dentists, mental hygienists, maternity and infancy specialists, and others. The needs of these groups are being carefully studied with a view to outlining the basic training necessary for the proper performance of their duties.

The Sub-Committee on the Educational Qualifications for Public Health Nurses is working with the National Organization for Public Health Nursing to revise the qualifications for public health nurses for the period 1940 to 1945. This report is revised every five years for the purpose of keeping qualifications as high as practicable to assure well trained personnel.

The Sub-Committee on the Educational Qualifications of Public Health Laboratory Personnel has been engaged in outlining desirable training for this group of specialists. It is expected to meet shortly for a further discussion of its problems.

Educational qualifications for adult health educators continue to be studied by the sub-committee of the same name.

A Sub-Committee on Field Experience Centers has been studying the best possible provisions that can be made for a period of practical field experience under capable supervision in a well rounded health department to supplement the theoretical training provided in classroom and laboratory.

The lack of adequate instruction and training of medical students in the basic principles of public health has been repeatedly pointed out. A Sub-Committee on the Teaching of Preventive Medicine to Undergraduate Medical Students is working in this field and is developing a plan for coöperation between the American Association of Medical Colleges and the American Public Health Association.

A representative has been appointed by the committee to work jointly with the National Organization for Public Health Nursing and the U. S. Public Health Service for the purpose of ex-

amining the content of the curricula of the schools of public health nursing throughout the country.

Each year the committee has collected data on the number of students enrolled in schools of public health and the number of degrees or certificates awarded. Wide interest has been expressed in these reports, and this year's findings are published in this issue of the JOURNAL.

At the suggestion of the Committee on Professional Education and the Conference of State and Territorial Health Officers, the U. S. Public Health Service has completed an extensive survey covering the educational qualifications of staff members now in service in official health departments. This gives us for the first time accurate information on the present level of training and experience in existing personnel which may be used as a basis for further plans and programs. This study will furnish guidance for much of the future work of the committee.

The committee recognizes a problem in relation to existing and proposed future schools of public health. Some state officials object to sending public health trainees outside the state, especially where some facilities for public health training exist within the state. These officials do not always appreciate the extensive facilities and highly qualified faculty necessary for a successful school of public health. This leads to a tendency in some states to develop what must become mediocre schools of public health. There is danger that a greater number of schools may be developed than will be necessary to meet the long-time demands for trained personnel. In addition to this problem, there exists at present no standard practice or even general agreement between existing schools of public health as to curriculum content for various types of public health trainees, and no common practice as to the type of degree to be awarded for a given amount of academic attainment. Finally, there is no common clearinghouse for schools of public health in which experience may be interchanged, or where reports may be received concerning the degree of success which their trainees attain in the practical application of the principles taught in the school. There appears to be a need for some organization among existing schools of public health and for a central advisory body which will function in a manner similar to the Council on Medical Education and Hospitals of the American Medical Association. How much of this is the proper function of the Association and its Committee on Professional Education is still undetermined. Your committee is exploring this field to ascertain in what manner the Association might be most helpful.

The committee gratefully acknowledges the numerous expressions of confidence received from the members of the Association and of the Governing Council, and for the opportunities it has had to contribute to the raising of professional standards in this country. It is ever aware of the need for continued building of adequate health service manned by competent men and women. Esteem for the profession will continue as long as public health workers are adequately trained and can demonstrate professional competence. We shall continue our efforts to urge that those entering the public health profession meet the high standards for which this Association has stood during its many years' existence.

Education and Training of the Physician for a Public Health Career*

EDWARD S. GODFREY, JR., M.D., F.A.P.H.A.
State Commissioner of Health, Albany, N. Y.

THE feature of the Social Security Act which distinguishes it from previous federal laws for the promotion of health and the one that has paid the greatest dividends, is that which provides for the education and training of personnel. The allocation of funds under this act imposes on the health officers of the several states and their component municipalities a trust that is of primary importance. They must see that the services to be rendered are important public health services and that they are well rendered.

There is no need today to labor the point that to render a service well, to render it with efficiency and economy, requires trained and educated personnel. The training and education of physicians for a public health career, if it is to be done with public funds, properly begins with the careful selection of those to be trained and educated. The method of selection, training, and education which I am about to describe was evolved in an effort to provide primarily a reservoir of satisfactory candidates for examinations held by the New York Civil Service Department for administrative medical personnel. It is believed, however, that it is adaptable to states operating under merit systems that are not established by state law and in states whose civil service does not cover professional personnel.

While many satisfactory lists of such personnel have been furnished by the Civil Service Department, particularly when the examination was open to non-residents of the state, unsatisfactory lists have been furnished also. The latter resulted largely from the extreme difficulty of judging the personal qualifications of candidates under any system of examination. Ignorance of a subject may be determined with fair accuracy by a written examination and oral interview, outstanding character defects may also be discovered by the interview, but a real judgment cannot be made until there has been a field trial.

It is true that the Civil Service Commission of our state regards the probationary period as a part of the examination. This was extended from 3 months to 6 months for medical personnel, since we found the former period too short in which to make a judgment fair to the probationer and fair to the department. However, two difficulties arise in exercising the right to drop a candidate on probation. Under our New York State law he must be dropped at the exact end of the probationary period. His deficiencies may be apparent in a week, yet he must be kept 6 months unless he resigns voluntarily or is discharged on charges.

The second difficulty is the situation in which the probationer finds himself when he learns that his services are unsatisfactory. Perhaps he has given up a practice, or more frequently a position in some other department which

* Read at a General Session on Professional Education of the American Public Health Association at the Sixty-ninth Annual Meeting in Detroit, Mich., October 10, 1940.

has since been filled. The embarrassment of any decently human administrator on such an occasion needs no elaboration. I am not speaking here of defects which would constitute the basis of formal charges, but of those deficiencies which determine whether the quality of a department is to be mediocre, good, or very good.

While a few outstanding people may give a *reputation* to a department, it is the quality of the service rendered through all levels that determines its real usefulness to the public. It is the duty of the department head to guard this quality, to raise it if he can, never permitting it to be lowered.

The probationer may have a good record of past performance. It may be he is a square peg trying to fit in a round hole. If there is a square hole available, the difficulty may be solved, but all too often the candidate must be dropped for the good of the service.

Another reason which led to the adoption of the present New York State system of selecting medical personnel was the restiveness of the legislature over the opening of examinations to nonresidents of the state. During every session in recent years, bills have been introduced to limit all examinations to residents of the state. Such a bill passed a few years ago, and it required the veto of Governor Lehman to preserve this important right to accept candidates from other parts of the country. However, a department head is now required to certify that a satisfactory list cannot be obtained from residents of the state, if he wishes an examination opened to nonresidents. Obviously such certifications cannot be too freely used. They must be reserved largely for the positions requiring some highly technical proficiency.

A further incentive to adopt a system which contemplates the training and education of personnel is the exhaustion of the national reservoir of men already trained through the demand created by the passing of the Social Security Act. This Act had the effect not only of expanding the health services and personnel of state and local governments, but also of the teaching institutions. In practically every instance the selection of a nonresident already trained for service in New York State meant that some other state or city lost a qualified man.

The method evolved sought to avoid some of the requirements normally attaching to appointments under the Civil Service Law and the Civil Service regulations made under its provisions. We felt the need to be free from the requirement that we retain an appointee for a full 6 months period in the event that his deficiency became apparent earlier. We felt the need of a longer period of observation and training without obligation for a permanent appointment, and the need of a status which would permit a selection in the first instance by the department on the basis of a review of the applicant's educational qualifications, without a written examination, and on what we could learn by inquiry of his probable adaptability to a public health career.

It is also believed that the subsequent education of a candidate in a formal school of public health will be enhanced by his relating what he obtains through lectures, reading, and laboratory work to an experience gained in the field. The physicians selected are designated as "epidemiologists-in-training." They are in the non-competitive class of the Civil Service. The primary reason for making these positions non-competitive is that we did not want mere "examination passers." Sometimes the difficulty of an administrative medical officer is that he knows all the answers and is not reluctant to let others know that he knows. Those selected are required to have been

graduated from an approved medical school, preferably with a rating of A or B, and to have served at least one year of internship.

With rare exceptions they must be under 35 years of age. The difficulty of transforming the habits and viewpoints of persons of greater maturity entering full-time health work seems an unnecessary obstacle to overcome if promising younger material can be found. This non-competitive appointment is limited to one year, as the Civil Service Law permits no longer appointments, except for certain exempt classes.

They are inducted into service following their selection by assigning them to one of the state health districts. In order that they may have a variety of experience and that the department may have a composite opinion as to the value of the individual, they are commonly shifted to different districts at intervals ranging from 1 to 3 months. Following their primary experience in a district office, they are assigned to the central office for a month's observation of its methods and requirements.

We regard this period of apprenticeship as one in which not only we determine something of the aptitude of an individual for a career in public health, but he determines for himself whether or not it is the kind of life he wishes to lead. Very few undergraduates in medicine have a clear conception of the duties and administrative functions of the modern health department. Some are fearful of "regimentation," others that its opportunities are severely limited so far as investigation, promotion of knowledge, and the other rewards—not necessarily monetary—that private practice and teaching institutions provide.

After a practical experience, usually of from 6 to 12 months, as an apprentice, those who show promise of qualifying for positions as public health officers are given a scholastic year's fellowship at one of the postgraduate schools of public health. The choice of such schools is based, as far as possible, upon the individual's preference. We believe, however, that it is highly desirable that they enter schools having students from different sections of the country in order that they may profit through their association with men who have been engaged in health work under a greater variety of conditions than would ordinarily obtain if the students came from the same part of the country. During this period at the school of public health, in order to avoid the limitations of one year in the non-competitive class, they are designated "physicians-in-training." As students in the public health school they are required to pass the examinations of the school, and their failure to do so automatically ends their apprenticeships in the State Department of Health.

Following the successful completion of their scholastic course and the completion of the minimum 6 months of field experience as epidemiologists-in-training, they are required to take a civil service examination for one of the assistant district positions in the State Department of Health. In this examination they are in open competition with physicians having other training and education. An individual must be within the first three on any list submitted by the Civil Service Commission in order to be available for appointment. As individuals are appointed from among these three, the next lower of those who have passed the examination becomes available for appointment.

Pending the announcement of the list, they are given provisional appointments to any existing vacancy to which the passing of the examination would make them eligible. Up to this time, there have always been such vacancies, and at the current rate of depletion of the staff, their existence seems likely to continue.

It will be seen that this method is

not designed for mass education. Our purpose is to select men of character, with courage and initiative who can fill not only subordinate positions in the department, but who have the capacity to develop. This development must be not only in the acceptance of responsibility, but in a capacity to develop as the field of public health develops.

It is considered highly important that those accepted for training and education have considerable initiative, a desire to excel as exponents of their specialty, an ability to overcome the influence of a bad example, to bear up under disappointment. Civil service in New York State offers a high degree of security of tenure. There is therefore the temptation to let down to merely "satisfactory" performance, and play safe by doing just that and no more. We seek those who have that inherent spirit which keeps them striving for a better way of doing things for the sake of seeing them done better.

The district offices to which epidemiologists-in-training are assigned are chosen not merely on account of the problems which the district affords, but also on the basis of the capacity of the district health officer's ability to instruct and inspire, and our trust in his judgment of the qualities of the candidates submitted to him for training.

During the period of training, as distinguished from the period of education in the postgraduate school, the candidate is required to take an extension course provided for local part-time health officers in New York State. This is essentially a reading course of certain standard works on public health, with written assignments for review. In addition they are made acquainted with other standard works on public health and with current public health literature. The staff member in charge of the extension course for local health officers is responsible for the fulfillment of this superficial postgraduate education.

The candidates are required further to study the state laws and sanitary code, the operating rules of the department, the plan of paper work; they are expected to gain an understanding of the importance of knowing the geography, the community facilities, and the population composition of the districts they serve. There is no particular effort made to inculcate an understanding of the underlying philosophy of the rules and regulations. We assume this to be the business of the schools of public health and we are trustful that these schools are fulfilling our expectations.

The description I have just given applies primarily to the training and education of physicians for positions in our district field staff. I believe this to be the reservoir from which may be supplied the district health officers, the full-time county and city health officers, and the higher department staff officers of the future.

It is believed that, even in the specialized divisions, a sound basic training in general public health administration may be of greater value in the promotion of specialized services than a high degree of clinical proficiency. Specialization in clinical branches often leads to an individualistic approach to problems which neglects the mass problem confronting the health administrator. For this reason, a number of members of the staffs of specialized divisions have been given scholarships for general postgraduate courses in public health.

Appointments as epidemiologists-in-training and physicians-in-training are not limited to selections made primarily by the State Department of Health. We accept candidates apparently having the basic qualifications we deem necessary who are recommended by city and county health officers. It is our hope that the health officers of our cities in particular will be able to find promising

material among the resident physicians of their communities who will serve the stipulated training period and take the postgraduate courses which will qualify them for full-time work. Such physicians will thus be prepared to assume higher responsibilities in local health departments when vacancies occur.

I have not mentioned up to this point the special types of education and training provided for members of the department staff already in the State Civil Service, nor short courses provided for practising physicians in special subjects. In general, these are given in coöperation with the State Medical Society. They are described by Van Volkenburgh in a recent paper.[1] I shall refer to only one of them, since it is a new venture, though one which we hope will be highly productive.

This is a course in public administration which has been devised by the Maxwell School of Citizenship and Public Affairs of Syracuse University. It provides instruction in law enforcement methods, personnel and office management, public speaking, group leadership, news release preparation, methods of influencing individuals through personal approach, and the technic of radio broadcasting. This appears to be a field which has not up to the present been covered adequately by the postgraduate schools of public health. The course consists of a series of 2 day monthly conferences, and during the past year has been attended by 35 members of the field staff.

I have assumed in the foregoing statements that the reader is acquainted with the operation of a good civil service system; one free from political control, and endeavoring to provide competent personnel. Palmer's recently published description of the present New York City Civil Service fits, with minor exceptions, the New York State system.[2]

I think it should be realized that in entering public health as a full-time career from private practice the physician burns his bridges behind him. Unless he is just entering practice or has resolved upon a change of location for other reasons, he relinquishes something which may be of such importance to him and his family that the attendant risk of future employment constitutes an almost insuperable obstacle to self financed training and education. He should have some assurance of future employment. The Rockefeller Foundation realized this years ago when it began its grants of fellowships in public health.

We have not, however, stipulated in our understanding with physicians accepted for training that they shall continue in the service in New York State or any of its component municipalities, nor do we obligate ourselves to place them. It is conceivable that through a reduction in state appropriations or federal appropriations available to the states that staff reductions may be necessary. Therefore, we cannot bind ourselves to anything in the nature of a definite commitment. Nor do we think it is fair to the individual that he bind himself for a stipulated period of service. We assume that in our selection we have been sufficiently careful to obtain individuals whose consciences will guide them to a decision that is fair.

Finally, I have attempted to make clear that we believe training and education to be two different but related things. Training, I conceive, to be more related to technics, while education is directed fundamentally to an understanding of the underlying principles, to a development of the individual's inherent intelligence, and to stimulating a desire for further knowledge, which desire will continue through life.

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Education and Training of Personnel Other than Physicians*

ABEL WOLMAN, DR.ENG., F.A.P.H.A.

Professor of Sanitary Engineering, The Johns Hopkins University, Baltimore, Md.

THIS is the second time that I have been confronted in Detroit with a compulsory opportunity to talk on the education and training of personnel other than physicians. The first time was at a meeting of this Association about 17 years ago, when I had more courage in my ignorance regarding the topic than I have today. At that time I ventured certain pronouncements regarding education and training which are repeated here today solely for the purpose of testing them against the progress in the intervening period and against the policies which prevail today.

The comments to which I refer were as follows:

"With the expansion in function of the sanitarian of environment, there must necessarily come a change in both the content of and the time for the training of such individuals. Such an analysis of future requirements leads the writer to the conclusion that the collegiate course must be more than 4 years, with a probable minimum of 6 years, for all students whose purpose it is to extend the years of life of man and to make those years less irksome by an attack on the physical world in which he lives. . . .

"And might we not even hazard the suggestion that elementary discussions of the anatomy, physiology, and pathology of man should find a place in the training of the engineer, as it now does, in necessarily more elaborate form, in that of the physician, whose future lies in the field of health promotion and prevention of disease." [1]

The proposals hesitantly suggested at the 1923 meeting of the Association represented at that time a major departure in point of view with respect to education, but one which was not wholly without precedent and support. In many ways the suggestions were reminiscent of the point of view and of the practices of the late Dr. Sedgwick, who for many years had emphasized the importance of training, particularly engineers and physicians, along parallel roads and for at least part of their curricula.

Today the demands of the science and the practice of public health control reinforce more than ever this earlier belief, that the training of non-medical sanitarians would require both in time and in scope more equipment than had been provided in the past.

The suggested educational requirements issued by the American Public Health Association through the Committee on Professional Education all confirm this observation. The proposals for the education of engineers, sanitarians, and sub-professionals, in 1937; of public health statisticians and of school health educators, in 1938;

* Read at a General Session on Professional Education of the American Public Health Association at the Sixty-ninth Annual Meeting in Detroit, Mich., October 15, 1940.

and of nurses, in 1939; include minimum undergraduate requirements generally of 3 to 4 years in length, plus graduate study. In most instances the total minimum term of study ranges from 5 to 6 years.

Recognition was given in these standards to the increasing necessity of superimposing upon the functional course of a specialized nature, general basic courses in biometrics, epidemiology, bacteriology, parasitology, and public health administration, particularly with respect to engineers.

Although the trends in educational requirements are generally the same in the various groups mentioned above, my later comments are restricted largely to the education of engineers, with whose requirements I am more familiar.

THE FUTURE

The problem which now confronts all those interested in the education of non-medical personnel, is what next? We are now approximately in the same position as students of medical education were when Abraham Flexner reviewed it in 1925. At that time he made the following pertinent observations, equally applicable to the education of public health workers.

"From what point of view are the problems of medical education to be studied and presented? That depends on whether medicine is conceived to be an empiric art, a science or something struggling toward scientific status. . . ."

"Modern society depends for its effective functioning on expert service. . . . Each requires its own technical discipline, but, more and more, it is obvious that professional training may be seriously crippled for the lack of a proper underpinning." [2]

It is our judgment that the answers to these questions of Flexner, with particular reference to engineering education, are clear and ought to be promptly acceptable. They are, that the non-medical sanitarian in general, of the professional grade, practises a science and requires a detailed and elaborate basic equipment as "underpinning."

If these principles are accepted the engineer must in increasing degree be provided with a strong undergraduate course in engineering in which the basic sciences are presented with comprehensiveness and strength. Upon these should be superimposed preferably in a minimum of 2 years of postgraduate work, or the equivalent in practice, essential training in the broad biological sciences so necessary to provide the engineer with an understanding of the ever expanding requirements of public health.

Professor Dugald C. Jackson of Columbia University has recently said "As long as one studies and gains additionally the benefits of life and experience, one may expect the efforts to be rewarded." This same philosophical concept was strongly raised in Flexner's observations and analyses many years ago. Unfortunately some non-medical sanitarians are beginning to inquire in an increasing degree whether this sound principle is being lost sight of in some of the recent efforts of professional workers in public health. The question may be properly raised for the Committee on Professional Education and for the Association at large as to whether a salary of $2,100 per year for a professional worker in the sanitary field, after 15 years of sound training and experience, adequately fulfils the principles of satisfactory reward for services to the public. Is a rate, furthermore, of $3,000 a year for the Chief Sanitary Engineer of a sovereign state in the United States a reasonable compliance with this philosophical principle?

If we assume that the standards of education promulgated by the Associa-

tion are essential to an adequate and efficient non-medical corps, should we not evaluate the probabilities of the acceptance of these increasing requirements for education? Can we expect young and active minds to select these fields of endeavor, when the rewards of training and of performance are so far below the theoretical expectancy?

THE DEFICIENCIES IN PRESENT TRAINING

While these matters are being given the serious consideration which they require, there are additional sins of omission in education which ought to be listed for future consideration.

Many of the efforts toward improved educational equipment do not provide sufficient time for the development of basic necessities. Attractive and expedient as short courses of training may be, they do not appear to provide solutions to this problem. They have the further danger of indicating an apparent compliance with a requirement which is not substantiated in fact. Injections of knowledge over a period of 4 to 6 weeks at high pressure are not substitutes for detailed and time consuming acquisition and digestion of scientific fact. Short courses for refresher purposes may be essential, but they have come to be accepted as substitutes for necessary and more complete equipment.

For engineers the time should come when a minimum of 2 years of postgraduate work in a Class A university should be required. This postgraduate work should be concerned, as already stated, largely with non-engineering basic biologic courses, for which time has not previously been available in the under-graduate curriculum. The understanding which these courses provide for engineering application in public health cannot be overestimated. In other words, it is increasingly apparent that the postgraduate equipment for a well trained engineer should have a greater public health emphasis than is provided in specialized functional training. Therefore, more time must be devoted to vital statistics, general health practices, epidemiology, bacteriology, physiology, and the like.

In addition, increased emphasis should be put on the problems of social organizations within the field of public health and non-medical sanitary operations. Little or no instruction is given in most courses on the economic problems of the community, on the relationship of public health endeavor to the general contests of society, and on social organization in general.

Certainly more emphasis might be devoted in formal courses to the impact of community, city, state, and federal planning on public health activities in general and on engineering work in particular.

Dr. Alan Gregg has recently pointed out the desirability of more discussion in medical schools on the historical evolution of medicine. A similar plea might be made for a greater interest in and instruction on the evolution of non-medical practice in the field of public health.

All of these additions to instruction naturally require time. They require exploration and interest on the part of teaching staffs. More important, however, they demand a recognition of the eternally expanding field of public health, in which the narrow purposes and practices of medical and non-medical sanitarians of the 90's can no longer meet the demands of modern society.

THE MEDICAL OFFICER'S FUNCTION

Dr. Godfrey has referred to "the health officers who know all the answers and are not reluctant to let others know that they know." I have heard rumors that there are such individuals. My experience without exception has been that the health officer has a sympathy

with, an understanding of, and a desire to use the values, the competence, and the experience which a non-medical sanitary worker can provide. There are some, and perhaps too many engineers, who would like to practise tuberculosis prevention, but there are probably more health officers who do not hesitate to practise the engineering arts. I have have yet to find the engineer who would risk embarking on a program of diphtheria prevention under his own steam. It is not so rare, however, that medical officers endowed with a public health degree venture to practise some of the black magic arts in the non-medical field.

Some of the non-medical sanitarians feel that a modest restriction of sphere of action, but not of sphere of influence, by the medical officer would materially raise the general level of performance of non-medical staffs. The latter require not only official high standards, but unofficial and personal sympathy with and recognition of their specialized functions.

The field of public health endeavor is so great that the opportunities for mutual coöperation are literally unlimited. The amount of work still undone is sufficient to require the forces of practically every individual responsible for a job. When a medical officer of health, however, declares that "one of the greatest misfortunes of recent years is that engineering men are showing too great an interest in public health problems," some renewed and frank arguments on the charge and its implications appear necessary. Can an engineer have "too great an interest in public health problems"?

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Public Health Degrees and Certificates Granted in the United States and Canada During the Academic Year 1939-1940

THE Committee on Professional Education of the American Public Health Association presents a report of public health degrees and certificates granted in the academic year 1939–1940. With the exception of the public health nursing tables, this report differs from reports published in previous years * in that this year the committee has included only graduate students enrolled in courses leading to graduate degrees and certificates. The basis for the record is *the number of students who have received degrees* rather than the number of degrees granted in the specified period.

Enrollment in Public Health Courses

Number of graduate students enrolled and public health degrees and certificates conferred during the academic year 1939–1940 by United States and Canadian universities. Unless otherwise indicated, courses require at least one year of residence.

TABLE I

Name of University	*Number of Graduate Students Registered*	*Graduate Degrees and Certificates Offered*	*Number of Graduates Receiving Each Degree and Certificate*
DeLamar Institute of Public Health, Columbia University	29	M.S.	24
Harvard School of Public Health	76 [1]	Dr.P.H.	4
		M.P.H.	42
		C.P.H.	2
Johns Hopkins University	124	Dr.P.H.	8
		M.P.H.	78
		Sc.D. in Hygiene	7
		Sc.M. in Hygiene	6
Loyola University	12	Dr.P.H.	0
		M.S.P.H.	0
Massachusetts Institute of Technology	19	Dr.P.H.	0
		Ph.D.	0
		C.P.H.	7

* *A.J.P.H.*, Vol. 29, p. 1338; Vol. 28, p. 863; Vol. 27, p. 1267; Vol. 26, p. 819; Vol. 25, p. 341; Vol. 23, p. 1124.

TABLE I (Cont.)

Name of University	*Number of Graduate Students Registered*	*Graduate Degrees and Certificates Offered*	*Number of Graduates Receiving Each Degree and Certificate*
McGill University	5	D.P.H.[2]	4
University of California	0[3]	C.P.H.	15
University of Michigan	181	Dr.P.H.	3
		M.S.P.H.	67
University of Minnesota	16[4]	C.P.H.	7
		M.S.	1
University of North Carolina	13	Dr.P.H.	0
		Ph.D.	0
		M.P.H.	4
		M.S.P.H.	3
		C.P.H.	2
University of Pennsylvania	16	Ph.D.	2
		M.P.H.	8
		M.S.P.H.	4
University of Toronto	20	D.P.H.[2]	20
Wayne University	2	Dr.P.H.	2
Yale University	37	Dr.P.H.	2
		Ph.D.	1
		M.P.H.	8
Total	550		331

[1] 20 were part-time students.
[2] Diploma in Public Health.
[3] Graduate courses were discontinued a year ago. However, students registered completed their courses in August, 1939, and were granted certificates in May, 1940.
[4] 4 were part-time students.

Classification of Public Health Degrees and Certificates Granted in the Academic Year 1939–1940

TABLE II

Degree or Certificate	*Number of Graduates Receiving Degrees and Certificates*	*Number of Schools Offering Each Degree and Certificate*
Doctor of Public Health	19	8
Doctor of Science	7	1
Doctor of Philosophy	3	4
Certificate in Public Health	33	5
Master of Public Health	140	5
Master of Science in Public Health	74	4
Master of Science	31	3
Diploma in Public Health	24	2
Total	331	

Graduate Students Enrolled and Degrees and Certificates Granted in Public Health and Sanitary Engineering Courses in the Academic Year 1939–1940

Table III

	Number of Graduate Students Reported	Graduate Degrees and Certificates Offered	Number of Graduates Receiving Each Degree and Certificate
	9	M.S.	5
	1	M.C.E.	0
		M.S. in Engineering	0
		Ph.D.	0
	42	S.M.	35
		Sc.D.	0
	3	M.S. in San. Eng.	1
		D.S.D. in San. Eng.	0
	6	M.P.H.	2
		M.C.I.	1
	8	S.M.	3
		C.D.	1
	23	M.S.A.	11
	17	M.S. in C.E.	0
	3	M.S.	0
	4	[illegible]	2
	3	[illegible]	1
		[illegible]	1
	4	[illegible]	0
		[illegible]	0
		[illegible]	2
	3	[illegible]	2
		[illegible]	1
		[illegible]	1
	3	[illegible]	1
		[illegible]	1
		[illegible]	0
		[illegible]	0
		[illegible]	0

Classification of Engineering Degrees and Certificates Granted in the Academic Year 1939–1940

TABLE IV

	Number of Graduates Receiving Degrees and Certificates	*Number of Schools Offering Each Degree and Certificate*
Doctor of Philosophy	0	5
Doctor of Science	1	2
Master of Public Health	2	1
Certificate in Public Health	0	1
Master of Science	48	13
Master of Civil Engineering	12	3
Engineer in Civil Engineering	3	3
Total	66	

Public Health Nursing Degrees and Certificates Granted July 1, 1939, to June 30, 1940

More than 5,000 nurses studied public health nursing in the 26 programs of study meeting the approval of the Education Committee of the National Organization for Public Health Nursing during the year ended June 30, 1940.

The following table indicates the enrollment and the number of students who received degrees and certificates for this period. These figures have been compiled by the National Organization for Public Health Nursing and are printed here with permission.

TABLE V

		Number of Students Receiving Each Degree and Certificate		
Name of University	*Number of Students Registered*	*Baccalaureate Degrees*	*Masters Degrees*	*Certificates*
Catholic University of America	73	2	0	0
Columbia University, Teachers College	452[1]	48	32	0
Duquesne University	56	0	0	2
Fordham University	69	2	0	2
George Peabody School for Teachers	367	18	4	51
Indiana University	54	10	0	0
Marquette University	110	1	0	12
Medical College of Virginia	31	0	0	17
New York University	1,000[2]	40	2	0
Professional Institute, College of William and Mary	79	7	0	38
St. John's University	73	0	0	0
St. Louis University	97	6	0	0
Simmons College	213	16	0	69
Syracuse University	167	2	0	14
University of California, Berkeley	443	87	0	29

[1] Does not include registration in summer session courses.
[2] Estimated figure.

(table cont.)

TABLE V (Cont.)

Name of University	Number of Students Registered	Number of Students Receiving Each Degree and Certificate: Baccalaureate Degrees	Masters Degrees	Certificates
University of California, Los Angeles	59 [1]	7	0	16
University of Chicago	53	0	0	0
University of Hawaii	10	0	0	8
University of Michigan	286	11	4	46
University of Minnesota	278	45	0	12
University of Oregon	107	34	0	49
University of Pennsylvania	283	4	0	29
University of Washington	132	53	4	25
Vanderbilt University	42	5	0	16
Wayne University	472	7	1	35
Western Reserve University	133	12	0	42
Total	5,139	417	47	512

[1] Does not include registration in summer session courses.

Students taking postgraduate work in public health nursing are increasing. Figures as nearly comparable as possible were secured for the year ended June 30, 1938. The following comparisons are of interest.

TABLE VI

	1939–1940	1937–1938
Individuals enrolled	5,139	3,700
Baccalaureate degrees granted	417	238
Masters degrees granted	47	17
Certificates granted	512	422

W. P. SHEPARD, M.D., *Chairman*

Report of the Chairman of the Executive Board to the Governing Council*

LAST October, at our 68th Annual Meeting, the American Public Health Association adopted a resolution declaring that peace is essential to public health progress. We reaffirm that belief, expressing our gratitude that by the grace of God we can report a year of peace-time activity in the United States, in Mexico, and in Cuba, and our sorrow that our Canadian colleagues have been bereft of this blessing.

Now our national capacities are devoted to furthering the defense movement initiated by the United States Government several months ago to insure peace in this hemisphere. Total defense is our continental objective. Public health is an essential ingredient of defense, not only public health as we know it in our work today, but in the full materialization of the concept —public health for three-thirds of the nation. Such total defense must concern itself with and provide services and facilities for the health protection of every inhabitant of North America. Only so shall we have a defense based on a people with sufficient vitality to realize our true goal, total peace.

We in the United States, together with our neighbors to the north and south, recognize that our mutual ideals demand a united defense. For public health unity, the American Public Health Association through amendment to its By-laws at this meeting, proposes to extend its Fellowship to include the health workers of all the Americas. We ask the Americas to join in a concerted effort toward the achievement of a defense which rests on a healthy people with the common objectives of freedom and social progress. To them we offer our experience and of them we ask full participation in our common task.

Our defense includes the training of large numbers of men transplanted from their usual environment into concentrated areas. The Surgeon General of the U. S. Public Health Service recently stated the problems which may face this profession in the event our man power is mobilized. Much of what he says is pertinent to other North and South American countries. He points out that traditionally we have been servants of peace, but that in these times of international conflict the developments of the medical sciences have expanded the scope of what doctors and public health workers can do for preparedness.

Dr. Parran reminds us that in times of stress the health problems of the military and civilian populations are inseparable. He has stated that none of the official agencies now have the benefits of a full working relationship with the great voluntary associations for health and welfare in which specialists in their technical capacities work side by side with citizens to spot leaks in the hull of our national man power.

* Presented at the Sixty-ninth Annual Meeting of the American Public Health Association in Detroit, Mich., October 10, 1940.

Although we have the most efficient industrial machines in the world, we still lack a comparable efficiency in the men and women who man machines, and the improvement of the health of industrial workers is an outstanding necessity today.

The Surgeon General also points to the need for listing and classifying all professional and technical personnel so that the recruitment and mobilization of medical and health staffs can be expedited.

Dr. Parran names the venereal diseases, tuberculosis, malaria, mumps, meningitis, and influenza among outstanding conditions which are of increasing importance in today's public health.

Important to the health of our people is the problem of medical, sanitary engineering, dental, and nursing staffs which will need to be drawn from civil practice to supply the needs of the armed forces.

These examples seem now to encompass a limitless job, but they represent in reality a composite of measurable tasks.

"If our democracy is to stand, we, as doctors, as health officers, as health workers, as citizens of our own free will because we know it is necessary must put medical science to work now fully to make our men as good as our machines."

Already, and over a period of several months, the Association has been called upon to clear a number of important matters dealing with national defense. It has advised with the American Red Cross and has assisted in the registering of available personnel in several categories of subordinate technicians and in the sub-professional levels. An effort has been made to keep abreast of the registration undertaken by such agencies as the American Medical Association, the American Society for Civil Engineers, the National Organization for Public Health Nursing, and others. All requests from official agencies for assistance in services of listing personnel have been promptly met.

As this report is written, a proposal is before the Executive Board looking to the appointment of a responsible Association committee on defense, expecting that it would be suitably interlocked with other committees of corresponding professional groups in order to avoid duplication and to accomplish the full purposes of the defense effort.

The Executive Board will recommend to the Governing Council that it be authorized to lend full Association aid in order to strengthen and sustain intelligent governmental effort for national defense. It is recommended that the Governing Council express on behalf of the entire Association support for an adequate defense program in which the constructive values of public health may be fully realized, not only in those defensive forces which may be mobilized, but in the basic resources of health in the entire population where lies the core of national defense.

These are controlling circumstances which face us today in the profession of public health. It may be that the requirements of public funds for the armament aspects of defense may become so acutely pressing that the provisions for civilian public health will suffer. But from every aspect, adequate provision for total public health is now more important than ever. The public health profession must join with intelligent citizens in making this fact emphatically apparent.

This continuing crisis may well affect administrative procedure. The demands of an expanding military organization may subtract the best trained and most effective administrative personnel from departments of public health, since the qualities that make them outstanding in ordinary times are highlighted in extraordinary times and

circumstances. Aggregations of large numbers of young men are sure to bring back into administrative practice a new realization of the importance of diseases such as measles, mumps, and meningitis, which took such terrific toll in 1917 and 1918. The prevalence of a preventable disease during a crisis is sometimes more serious than the loss of a battleship. That we are becoming increasingly aware of the need for special methods to handle emergency situations is evidenced by the action of the American Red Cross and Harvard University in establishing a unit in London to study the control of communicable diseases in wartime. Just as the Army has its high officials watching the military tactics of the Battle of Britain, so the public health profession has its strategists watching the third of the Four Horsemen.

For adequate protection of both the armed and civilian forces, there must be close liaison and coöperation between military authorities and local health officials, including state, county, and municipal health officers. This is so obviously true with regard to control of the venereal diseases, it is not likely to be forgotten. It is equally true with respect to the gastrointestinal diseases, and the other diseases mentioned. Defense necessity cannot tolerate mediocre health services at local levels, especially under the extraordinary demands of the new mass methods in warfare. Civilian health officials must know the health problems created by the presence of a large number of troops in their jurisdictions. Relationships based upon full understanding between civilian health officials and Army officers in charge of the health of the troops are of the utmost importance.

It is ironic that the "stately purposes" of our profession are now directed in many countries, of necessity, toward salvaging what remains after destructive forces have been at work. It is ironic, too, to reflect that the hideous efficiency of modern warfare is undoubtedly producing in these countries an efficiency unequalled heretofore in organizing and conducting emergency services for combatants and noncombatants alike.

As successful war maneuvers in our time seem to depend upon the degree of coördination between land, sea, and air forces, it probably follows that the effectiveness of the mercy squads depends upon the coördination of medical, nursing, and engineering facilities.

Planning for defense involves the acquisition of materials and men for the making of war, of machinery and personnel for the alleviation of the effects of war, and the knowledge of how to put all the factors into vigorous action—whether they stand idly by forever, as is our earnest hope, or whether it is necessary to use them.

If this introduction to a report of the Executive Board to the Governing Council appears to be preoccupied with developing events rather than with an account of our stewardship, it is because these events cannot fail to affect profoundly our profession as it is organized in the American Public Health Association. In looking back over the past year, we have attempted to reduce the Association's multitudinous activities to succinct accomplishments and to select certain highlights indicative of trends, always with an eye on the actual performance and the spirit in this organization ready for a defense program.

It is difficult to handle the highly varied and volatile material that constitutes any year in the Association's history. Much of importance evaporates before it can be recorded. Even with the evaporation process continually operative, an entire volume of the *American Journal of Public Health*, plus the *Year Book*, plus the thousands of other pages produced since last Octo-

ber offer insufficient space to capture what is left of a year's work. We point with pride to the *Journal*, now in its 30th volume, as the universally recognized medium for exchange of information and for the instruction of health workers on this continent. Its value in a defense program is unmistakable. We congratulate again its editor, Dr. Mazÿck P. Ravenel, on his sixteen years of devoted service.

The *Journal* and the *Year Book*, and all the publications of the Association represent the voluntary labor of the members of the Association, of whom there are now 6,900. About 14 per cent of these, nearly 1,000, occupy official positions of some sort in the organization, the great majority as members of our 98 technical and administrative committees. The total membership grows healthily from year to year, and the Fellowship and Life Membership gradually increase. The Governing Council has before it at this meeting 123 Fellowship applications and 36 applications for life membership, reflecting a most encouraging tendency toward career service. Where else but in the ranks of the American Public Health Association would be found the leaders and the workers, the experience and the background to project the public health aspects of a defense program?

Full documentation in regard to the 98 committees referred to is in the Association files and in the *Year Book*. An appendix to this report carries abbreviated accounts of a number of them. Some of their published and unpublished studies have the utmost significance in planning and maintaining national defense, especially those of the Industrial Hygiene, Laboratory, and Engineering Sections. The affairs of the Committee on Administrative Practice, Committee on Hygiene of Hearing, and Committee on Professional Education will be reviewed in special sessions this week. Their place in the national effort is obvious. Three of the Standard Methods Committees of the Laboratory Section will soon produce the result of their labors through the publication of new editions of *Standard Methods for the Examination of Water and Sewage*, and *Standard Methods for the Examination of Dairy Products*, and of the first edition of *Standard Methods on Diagnostic Procedures and Reagents*—more important in their subject matter than ever in the great dislocations which may result from mobilization.

Many other activities of the Association have implications for the defense program—the Employment Service for recruiting personnel, the Information Service, our highly important Annual Meeting for securing unity of thought and action in public health undertakings, and the meetings of our Western and Southern Branches for similar purposes in regional areas.

There are some items which must be reported to the Governing Council outside the field which we have been exploring.

MERIT SYSTEMS

A year ago Congress amended Title V of the Social Security Act to require that personnel in the states supported by these funds should be protected by state merit systems. Almost half the jurisdictions were under existing civil service regulations, and the other half had to set up merit systems for themselves, sometimes in conjunction with the old age and public assistance aspects of the Social Security Act—sometimes separately.

All jurisdictions but one have now submitted proposals for merit systems to the Children's Bureau and a substantial number have been approved. The process of classification and examination of the existing situations is under way, together with the recruitment of qualified personnel.

Although the amendment does not apply to Title VI of the Social Security Act, the Surgeon General has issued an order which in effect makes the same restrictions cover all funds spent under the auspices of the Public Health Service.

The American Public Health Association has received a request from the federal agencies for assistance, with special reference to recruitment, the preparation of examination methods and material at the professional level, and the preparation of a "frame of reference" covering all titles in the public health service.

It is refreshing to see the federal agencies at this critical juncture standing their ground against any and all efforts to sabotage or weaken the program.

ASSOCIATION EXHIBIT AT NEW YORK WORLD'S FAIR

There has been on display at the New York World's Fair 1940, in the Medicine and Public Health Building, an entirely new exhibit sponsored by the American Public Health Association. It will be recalled that contributions of the membership made an exhibit possible during the first season of the Fair. This year it was redesigned, constructed, and maintained without additional cost to the Association through the generosity of the American Museum of Health, Inc. Presumably this exhibit will be removed at the conclusion of the Fair to the permanent building which has been assured to the American Museum of Health by the authorities of the City of New York.

FINANCIAL STATUS

The financial situation of the Association gives cause for satisfaction. The year ending December 31, 1939, saw a small surplus, and to August 31, 1940, both estimates of expense and income have kept approximately within the budget adopted by the Executive Board on December 18, 1939, which anticipated total expenditures for the year of $161,460, and total income of $161,550.

ACKNOWLEDGMENTS

Dr. Ferrell last year said in his report "The voluntary contributions to the American Public Health Association really make it the influential service organization it is, and it is appropriate that I should congratulate those who have given service, whether members of the Governing Council, the Executive Board, the sectional committees, the standing committees, or in some other capacity." To that gracious acknowledgment, I should like to add thanks to the providers of funds for Association purposes without which a good deal of our work could not have been done this year, or any year. These donors include the W. K. Kellogg Foundation, the Metropolitan Life Insurance Company, the Milbank Memorial Fund and the John B. Pierce Foundation, the Commonwealth Fund, the Charles H. Hood Educational Trust, and our sustaining members. It is hardly necessary to identify for this group the projects for which these funds are used. In the order given, the grants are utilized for the Rural Health Conservation Contest and the studies of the Committee on the Evaluation of Administrative Practices, the City Health Conservation Contest, the Committee on the Hygiene of Housing, State Health Studies, Committee on Community Organization for Health Education, general Association purposes. Thanks must be tendered also to the service organizations which continue to advertise in our *Journal* and to exhibit at our Annual Meetings.

ABEL WOLMAN, Dr.Eng., *Chairman*

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HEALTH PREPAREDNESS

REGISTRATION for the Selective Service draft is upon us and preparations are being made for the draft if and when necessary. The shadow of war—even total war—is over us for the first time in our history. It has been repeatedly said, and truthfully, that the most important single resource of any country is man power, and it is that fundamental resource that we are concerned with here. It has been often said there is no medical man on our National Defense Council. However, we have already pointed out,[1] the American Medical Association, in June, appointed a Committee on Medical Preparedness, on which there is a member of our Association, who is a doctor as well as an authority on public health.

On September 19, 1940, an order was signed by the President establishing as a subordinate body to the Council of National Defense, a Health and Medical Committee. This committee consists of Dr. Irvin Abell, as Chairman, the Surgeons General of the Army, the Navy, and the Public Health Service, and the Chairman of the Division of Medical Sciences of the National Research Council. The duties of this committee are to advise the Council of National Defense concerning the health and medical aspects of the national defense and to coördinate health and medical activities which affect national defense. The committee is authorized to utilize laboratories, equipment, and services of the medical departments of the Army, the Navy, the Public Health Service, and other government institutions, and within the limits of appropriations allocated to it, to make contracts with educational or scientific institutions and individuals for studies and investigations. This action has settled the repeated criticism that there is no physician on the National Defense Council.

Two important meetings concerned with medical preparedness have been held, one on September 16, in Washington, D. C., when the Surgeon General of the Public Health Service called the State and Territorial Health Officers in conference, and the other in Chicago at the headquarters of the American Medical Association on September 20, 1940. The points brought up and the discussion on them were searching and enlightening, but here we cannot do more than touch on some of the high points.

At both meetings figures given by Surgeon General Parran were discussed. The Selective Training and Service Act contemplates the registration of some 16,500,000 men with the immediate physical examination of from two to four million. There will be 100 induction boards to make final examinations before the men are sent into cantonments, and on each board there will be an orthopedist, a general surgeon, three internists, two ophthalmologists, one otolaryngologist, one neuropsychiatrist, one clinical pathologist, and one dentist. X-ray examinations of the chest will be made only when necessary to determine the physical fitness of a man, and only examinations of sputum and urine will be made. After induction a general x-ray examination is proposed, for which 100 x-ray machines have been ordered and will be delivered within 6 months. The U. S. Public Health Service has undertaken the collection of bloods and serological examinations. On the basis of estimated infections in the civil population of draft age, among the 16 million men there will be 300,000 cases of syphilis in the infectious stage, "a case finding program of proportions never before contemplated."

A great and immediate problem is the handling of the sanitary and health emergencies of mobilization and the movements of bodies of troops in many states. Industrial mobilization and expansion offer other great problems—the care of accidents, disease and physical impairment. As pointed out by Surgeon General Parran, we are not prepared to protect men working in the new and hazardous processes being introduced nor to alleviate the burden upon housing, medical and health facilities made necessary by the population shifts.

A most important question is exemption of medical students, interns, and residents. The Selective Service Act exempts young men in universities in training for degrees in science, and many medical schools do not graduate until the internship has been completed. However, Colonel Spruit, medical adviser to the joint Army and Navy Selective Service Board, in attempting to answer the questions asked, read parts of the law, and said that as the matter now stands, "exemption" or "deferment," two words used in the law, will be largely a matter of interpretation. He pointed out that there are 23 ROTC units in the country and that the men in their junior and senior years are exempt from registration. Students entering college courses will not be called until July 1, 1941, though they must register. He said that if he understood the law correctly, ROTC medical students do not have to register, the assumption being that they will go into the Reserve Corps on graduation. With the experience of the English during the World War, and ourselves to some extent in our own country, it is inconceivable that the training of medical students will not be continued uninterruptedly though at present the law does not seem to be clear on the subject.

A Nursing Corps for National Defense was organized some two months ago. The first project is a nation-wide census of registered nurses to determine which are available for military and which for civilian duty in their homes or elsewhere. Our Public Health Service has been asked to serve as official sponsor of this survey.

There is no ready information on the sanitary engineering personnel in the country, but this is being considered. We have no definite information on the quantity and quality of clinical laboratory service, nor do we know how many laboratory technicians can be spared for military service without crippling existing laboratories. We are also without comprehensive knowledge concerning local health organization, and we need data on the local health control of food supplies, "including milk; housing facilities; refuse and garbage disposal; medical services,

including physicians, dentists, hospitals, and clinics; local public health organization; industrial hygiene facilities."

It will be seen that there is an enormous amount of work to be done, but, as already pointed out, the medical profession will be prepared. Since there has been no appropriation for such service, it is interesting to note what Colonel Spruit says concerning the policy of the Selective Service: "There is a strong feeling in Congress and throughout the Nation that, inasmuch as men are being called to military service at great personal sacrifice, Selective Service officials should be men willing to make an important sacrifice by contributing voluntary service, and that a process based on the devotion to the national interest should not deteriorate into a job-holding organization." Physicians and public health men have always shown such a spirit and no doubt will respond in the present emergency.

PREVENTION OF RABIES

IT is just 60 years since Pasteur began his monumental work on the study of rabies, and 55 years since his first success was achieved in protecting a person (Joseph Meister) bitten by a rabid dog, by the use of his vaccine. In the meantime Pasteur Institutes have been founded in many parts of the world, and it has been estimated that considerably more than a million persons have received the treatment. The value of it has been accepted as a fact following careful experimentation and observed practical results.

Study of the disease and attempts at improving the original method of Pasteur have been carried out by many scientific workers but until fairly recently no serious doubts have been brought forward as to the essential soundness of the practice and the value of its results.

In this country a rather lively discussion has been taking place, aroused by the answer to a query in the *Journal of the American Medical Association*[1] in which cauterization of the wound by any method was advised against, and furthered by an excellent report on a study made by Denison and Dowling[2] on rabies in Birmingham, Ala., from which they concluded that the value of the vaccine treatment was exaggerated, since of 48 persons who died of rabies, 23, or 48 per cent, had received prompt and adequate preventive inoculations. Both the answer to the query and the paper mentioned called forth a number of replies, taking exception to some of the statements made. Denison and Dowling "are especially concerned with those problems which confront the physician; namely, the value of antirabies vaccine and indication for its administration." They condemn "indiscriminate" vaccination, with which all will agree, and lay stress on the importance of controlling the dog, with which also everyone must agree. Some other points are more open to question. Pomeroy and Swartout[3] have subjected the paper to critical analysis, and do not agree with the conclusions or the grounds on which they are based.

Concerning the value of cauterization of the wound, Denison and Dowling, Kellogg,[4] Pomeroy,[4] and Gloyne,[5] disagree with the *Journal of the American Medical Association,* advising strongly the use of nitric acid, in which many others, including the writer, agree. However, a warning must be given. Cauterization, no matter how effective, must not be relied upon entirely, and whenever the skin is broken the Pasteur treatment must be begun at once. This is pointed out forcibly by Muckenfuss,[4] whose statement we endorse: "I myself am unacquainted

with any bite of a known rabid animal resulting in a definite wound which should not be followed by antirabies vaccine."

As far as the Pasteur treatment is concerned, perhaps the most reliable figures are those kept by the Pasteur Institute in Paris, in which every attempt is made to determine whether the biting animal was positively rabid or not. These reports as well as those from other Pasteur Institutes in various parts of the world have for a number of years been summarized and analyzed by statisticians for the League of Nations. The Eighth Analytical Review of Pasteur Institutes, 1938, gives for 1935, 123,040 cases treated, with 332 deaths, or 0.27 per 100. The 8 reviews so far published include 758,182 cases treated, with a total death rate of 0.36 per 100.[6]

It is pointed out that results are constantly growing better. In spite of the objections which have been raised to the treatment, the acknowledged failures in a certain proportion of cases, and the paralytic accidents which occur as a result of the injections, we would fail in our duty if we did not advocate as strongly as possible the administration of the Pasteur treatment in all cases bitten by rabid animals whether or not thorough cleansing, as advised by the *Journal of the American Medical Association,* cauterization by any agent, or any other method of local treatment has been carried out.

Everyone who has had anything to do with the administration of the Pasteur treatment has met persons with an abnormal fear of rabies who are not amenable to reason or advice and who, often backed by relatives, demand treatment. In such cases it seems justifiable to administer it, or better, as has been done, to inject salt solution. The danger of treatment paralysis exists and must be acknowledged. However, it is slight. Among the 758,182 cases reported above, there were 13 cases of treatment paralysis, or 1 for each 10,729. There were only 4 deaths.

It would be foolish to say that the last word concerning rabies and the Pasteur preventive treatment has been said. There is much to be learned. Studies are going on in this country in several institutions which will no doubt give us further light. Much information has already been gained in some of these studies though publication has not been, and will not be, made until completion of the work. From other places, notably the Rockefeller Institute, in New York, enlightening material has been given to the profession. We can mention here only the development by Webster [6] of a reliable test in the mouse for the estimation of the potency of antirabic virus. This is a long step forward in giving accurate data for the determination of values now in dispute.

In the meantime it is a part of wisdom not to discard methods which in the opinion of countless scientific men have given good results in the saving of life.

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6. Eighth Analytical Review of Pasteur Institutes, 1938. *Bull. Organ. Hyg.*, S.D.N. Abst. *Ann. Inst. Pasteur*, Vol. 39, 1939.
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THE AMERICAN MUSEUM OF HEALTH

THE American Museum of Health, which won its spurs during the New York World's Fair, is taking over as a permanent home in the new Flushing Meadow Park, the former site of the Fair, on the development of which New York City intends to spend more than two million dollars, the building which housed the Masterpieces of Art Exhibit, which is admirably adapted to museum purposes. The splendid collection of material has been transferred from the Medicine and Public Health Building for permanent display in the Museum. The Museum, by the terms of its contract with the city, has pledged itself to coöperate extensively with the Department of Education and the Department of Health. As a semi-official institution, it will have a continuous load of visitors from public, private, and parochial schools, with which organizations it will jointly plan a health education program.

The outstanding interest shown in the Medicine and Public Health Building during the World's Fair demonstrated the wide appeal of this type of education. There was a total of 11,800,000 visitors, or about 27 per cent of the total paid attendance. It proved the practicability of the museum technic as a vehicle for the mass dissemination of health information that has been lacking in the field. The American Museum of Health fulfils the need for an efficient method of distributing the fruits of medical progress among the people.

During the Fair, the Medicine and Public Health Building functioned as a tremendous laboratory where pioneer experimental studies were carried out on visitor reaction and on exhibit technic. A vast amount of clinical data has been assembled in the past two years which will provide criteria by which the Museum will be guided in setting up its permanent displays. Embarked upon a permanent exhibit program, it will undertake other closely related aspects of health education.

Credit for original spadework in developing the idea must be given to the American Public Health Association, which in 1930 set up a committee under Victor G. Heiser, M.D., to study the problems involved and to encourage the organization of museums of health in America. This committee effected a natural coalition with the New York Academy of Medicine, which for years, through a committee under the chairmanship of George Baehr, M.D., has promoted plans for a medical museum in New York City. This coalition was aided by agencies of the National Health Council, the American Medical Association, state and local medical societies, and developed the exhibit on Medicine and Public Health which was shown by the Museum at the New York World's Fair.

The new Museum has been fortunate in the character of its financial sponsors. The Carnegie Corporation, the Josiah Macy Jr. Foundation, the Metropolitan Life Insurance Company, the New York Life Insurance Company, the Aetna Life Insurance Company, the Connecticut Mutual Life Insurance Company, the Guardian Life Insurance Company, the John Hancock Mutual Life Insurance Company, the Provident Mutual Life Insurance Company, and the Travelers Insurance Company made it possible for the Museum to establish itself soundly by their generous grants of money. The exhibit devoted to human physiology which was featured in the Hall of Man, and which now forms the nucleus of the permanent exhibit, was the gift of the Oberlaender Trust, of Philadelphia. The sponsored exhibits that made up the Hall of Medical Science were the gift

of the 21 pharmaceutical houses, philanthropic organizations, and medical and health associations represented in the Medicine and Public Health Building.

Mayor Fiorello H. LaGuardia is a member of the Board of Directors and one of its staunchest supporters. Through him the Museum obtained not only the support of the New York World's Fair, but also its new home in Flushing Meadow Park. The group of executives who tirelessly nurtured the Museum idea to reality included Louis I. Dublin, Ph.D., and George Baehr, M.D., Chairman and Vice Chairman of the Board of Directors; George McAneny, its President; Victor Heiser, M.D., Malcolm Goodridge, M.D., David J. Kaliski, M.D., Sam A. Lewisohn, James Marshall, Seth M. Milliken, M.D., Frederick Osborn, John L. Rice, M.D., George Vincent, Ph.D., Livingston Farrand, M.D., and Homer N. Calver, Secretary and Acting Director of the Museum, who for seven years was the Executive Secretary of our Association.

It is the aspiration of the American Museum of Health to provide, by its demonstration, the inspiration necessary for the expansion of the health museum idea on a national scale to which concept the Association Museum Committee is dedicated. Already a step has been taken toward this realization. Late last month the first regional museum opened its doors to an eager public in Cleveland. The Cleveland Health Museum is the fruit of happy coöperation of the medical profession, health associations, the health department, and various public spirited individuals and organizations in that city. Leaders in the enterprise were Lester Taylor, M.D., James A. Doull, M.D., Howard Whipple Green, Richard A. Bolt, M.D., H. Van Y. Caldwell and Mrs. Francis F. Prentiss, who presented her mansion on Euclid Avenue for the Museum's use. The Cleveland Museum is under the capable direction of Bruno Gebhard, M.D., who, formerly of the German Museum of Hygiene in Dresden, received his first experience in this country as Technical Consultant to the American Museum of Health. Coming on the heels of the announcement from the American Museum of Health, this news out of Cleveland indicates that the museum of health idea is acquiring momentum, and it will be only a matter of time before other progressive cities adopt it. Thus, the seminal work of the American Public Health Association bids fair to become reality.

We can rest assured that the American Museum of Health, under its competent leadership and with the active coöperation of all public health workers, will continue the splendid work in the preservation of health and the conservation of life which it initiated so auspiciously during the World's Fair years. We predict and wish for the American Museum of Health a long, fruitful life in the service of man.

Credit Lines

A Selective Digest of Diversified Health Interests

D. B. Armstrong, M.D., and John Lentz, M.S.

Bigger and Better

THE curtain had barely descended on the Seventh Annual Health Education Institute in Detroit before the inevitable question was asked on all sides: "What did you think of it?" The answers overheard were decidedly favorable, and the editors of this section are among those who willingly joined the chorus of praise. Institutes of previous years offered much that was worth while to those in attendance, but the 1940 Institute reached what seemed to us an all-time peak in the presentation of informative and stimulating speeches, discussions, and papers. A detailed record of the subject matter discussed during the sessions will be distributed at a later date to those who were in attendance. Many of our colleagues, however, did not attend and will receive no information on the Institute, and for this reason "Credit Lines" wishes to devote most of its space in this issue of the Journal to a thumbnail summary of the proceedings.

Over 300 students were registered, and a more alert and eager group has seldom been assembled. This was demonstrated time and again when speakers happened to move from the range of the microphone. Immediately cries of "We can't hear—we can't hear!" were set up—thus demonstrating that the audience did not want to miss one word of what was being said. It was especially encouraging to note the number of new and young faces present at the Institute. When the sessions finally ended, one saw bulging notebooks and file-cards packed with information. Here was concrete evidence that the Institute had supplied its students with a wealth of material. If the information thus recorded is put to use in all the localities from which the students came, the Institute's purpose will be fully achieved. Dr. Ira V. Hiscock, incidentally, stated the Institute's purpose in these words: "This Institute is held for two reasons: (1) To enrich our thinking by drawing upon the experience of our associates; (2) To share this knowledge in order that all of us may look at our jobs with a broader viewpoint."

The program embraced so many interesting features that we darted, gadfly-like, from one discussion group to another in order that we might sample all the Institute's wares. It would be difficult to select the outstanding feature of the Institute, for in every quarter we found worth while proceedings under way. Nevertheless, it seems to us that Dr. W. W. Bauer's paper entitled "The Philosophy of Health Education" is worthy of special mention. It was one of the most studious, constructive, and learned presentations that we have heard at this or any other Institute. Dr. Bauer stressed the fact that health education must be done by earnest people, that the profession has no room for the dilettante. "More earnestness, less lip service," said Dr. Bauer, "is needed." And with this we fully agree. The philosophy of health education was outlined by Dr. Bauer

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in a very novel fashion. He pointed to the following as the chief factors that enter into our philosophy:

*H*onesty
*E*arnestness
*A*ccuracy
*L*ogic
*T*enacity
*H*umor

*E*fficiency
*D*iplomacy
*U*nanimity
*C*ulture
*A*daptability
*T*echnique
*I*ngenuity
*O*bjectivity
*N*ovelty

A word about Dr. Bauer's delivery is in order, for more speakers like him are needed in health education. He plunges into his subject with enthusiasm and snap and, from his opening sentence to his closing remarks, his material is delivered neatly, precisely, and impressively. In fact, his speech-making is so perfect that we feel Dr. Bauer must be wired for sound! This particular Institute paper was spiced throughout with wit and wisdom and we urge the readers of this section not to miss it when it is published in the JOURNAL at a later date.

Dr. C. V. Akin's * paper entitled "The Status of Public Health Education" left the audience with a full measure of things to think about. The data upon which this paper was based stemmed from an analysis that had been made of 120,000 health pamphlets and 160,000 health quizzes. Some of the facts that came to light as a result of this study prove that there are many loose ends in health education that need to be gathered up. For instance, we whose watchword is accuracy were abashed to learn that we are not always guiltless of making conflicting statements in the printed material which we distribute to the public. This was borne out by a study of 15 measles pamphlets in which 4 different incubation periods were cited. Such inconsistencies in our work is enough to create a lack of confidence in our efforts on the part of the public. Dr. Akin's study clearly indicated that we health educators need to get together for closer coördination and planning to forestall the appearance of such misleading statements in our literature and to avoid duplication of material. A proposal was made that we establish an agency in which information as to our resources might be pooled and shared. Undoubtedly this would be a step in the right direction, and it is one which the National Health Council has at times explored, not getting very far because of inadequate facilities.

A great deal of interest centered around Dr. Bruno Gebhard's paper called "Grandma Is Not Always Wrong." This was a timely and clever presentation. Dr. Gebhard suggested that we cease centering our efforts upon the so-called "average man" and focus our attention on grandma who is the personification of the family—and it is the family as a unit that we want to reach with health education. One of our jobs, then, is to convince grandma that our wares are genuine, but grandma is something of a skeptic. And justly so, because in her lifetime she has seen the truths of today become the errors of tomorrow. Grandma, for instance, has seen the fundamentals in baby feeding change at least three times; she has seen so-called tuberculosis "cures" come and go; and she has seen pasteurization denounced at first and recognized later. And now she hears about our vitamins, glandular therapy, x-rays, and sera. She is proud of this progress, but still she remembers some of the glowing claims that we have made in the past and so she takes our present claims with a grain of salt. Dr. Gebhard

* See page 1436, this issue.

color is effectively employed, the essential message is easy to read, and there is no confusion in the use of type. Here, then, is a poster that every health agency can display with pride. On the other hand, it may appear to many that the poster entitled "No Home Remedy or Quack Doctor Ever Cured Syphilis" falls short of the standard of excellence set by the other posters in the series. The design seems confusing to the eye, the numerous styles of type employed in the layout likewise tend to confuse the reader, and the essential message is almost completely lost as it is placed at the bottom of the poster where it is submerged by the color and detail of the surrounding layout. A more serious criticism that occurs to us is that this poster may possibly mislead some people who will read it hastily. The focal point of the poster contains this statement, "Dr. Welsh's G O N - M E D — recommended for use in the treatment of gonorrhea." Isn't it possible that this statement will be misconstrued by some casual readers as a recommendation for a so-called "sure cure"?

On the whole, however, we highly commend and recommend the useful publicity materials that the Division of Venereal Diseases is producing.

RADIO SPEAKERS—PLEASE NOTE

December is a month when health officials are frequently called upon to make radio addresses in connection with Community Chest drives, Christmas Seal campaigns, and other seasonal activities. A little pamphlet issued by the National Association of Broadcasters, in which pointers for radio speakers are set forth, is therefore worthy of attention. If you are interested in developing a "radio personality" and in observing "radio etiquette," remember these pointers:

1. You *speak*—you don't shout.
2. The audience you have depends upon what you say in the first 2 minutes of your talk.
3. Tie up your introduction with something timely, well known or unusually pertinent.
4. Few speakers can hold radio attention for more than 15 minutes.
5. Write short sentences. Use picture words. Try it on a friend. Remember, you have radio competition.
6. Be friendly. Be sincere.
7. *Do not cough or sneeze into the microphone.*

Just in case you may consider yourself an experienced radio speaker who needs no further advice on the subject, we drop this gentle hint—the National Association of Broadcasters sent a copy of their little booklet to Franklin D. Roosevelt!

SCIENCE THROUGH THE CAMERA'S EYE

Watson Davis's new book entitled *Science Picture Parade* is worthy of a most laudatory review, despite our hesitancy to recommend it. We confess that this hesitancy on our part springs from pure, unadulterated jealousy. Several years ago we conceived the idea of a book embodying a collection of photographs dealing with scientific progress and to this end we had accumulated a file of pictures. Moreover, we had planned to arrange the pictures and accompanying text along lines almost identical with those followed by Mr. Davis. But the gestation period of our book was too long—thus permitting Mr. Davis to deliver his book before ours saw the light of day. There is consolation for us, however, in the realization that Mr. Davis has done a superb job, and we congratulate the author on his attractive, informative, and well written book.

Science Picture Parade covers many important fields of man's endeavor in which science plays a stellar rôle. Chemistry, radio, meteorology, electricity, archeology, and health are among the subjects discussed and pictured. The section on health is especially well presented. This section touches upon

chemotherapy, cancer, mental disease, vitamins, hormones, and other pertinent topics. Among the dramatic photographs found in the health section are the celebrated shot of a sneeze, the arresting photo of a recent smallpox case in New York State, and a microphotograph of the crystals of vitamin B_1.

In Mr. Davis's book one finds the mighty story of science told as effectively by means of the lens as it has been told before by means of the pen. *Science Picture Parade* deserves a place on the shelf of every health education library.—*Science Picture Parade,* by Watson Davis. 327 pages. Published by Duell, Sloan and Pearce, Inc., 270 Madison Avenue, New York, N. Y.

BOOKS RECEIVED

IT IS YOUR LIFE. Keep Healthy—Stay Young—Live Long. By M. M. Rosenberg. New York: The Scholastic Book Press, 1940. 450 pp. Price, $2.50.

THE CONTROL OF TUBERCULOSIS IN THE UNITED STATES. By Philip P. Jacobs. Rev. Ed. New York: National Tuberculosis Association, 1940. 387 pp. Price, $2.00.

BE SAFE AND HAPPY. By Sallie Stribling and Antoinette Williams. New York: Heath, 1940. 96 pp. Price. $.32.

THE NEUROSES IN WAR. Emanuel Miller, Editor. New York: Macmillan, 1940. 250 pp. Price, $2.50.

BACILLARY & RICKETTSIAL INFECTIONS. Acute and Chronic. By William H. Holmes. New York: Macmillan, 1940. 676 pp. Price, $6.00.

INTRODUCTION TO PARASITOLOGY, WITH SPECIAL REFERENCE TO THE PARASITE OF MAN. By Asa C. Chandler. 6th ed. New York: Wiley, 1940. 698 pp. Price, $5.00.

PENNY MARSH FINDS ADVENTURE IN PUBLIC HEALTH NURSING. By Dorothy Deming. New York: Dodd, Mead, 1940. 236 pp. Price, $2.00.

FACTORS AFFECTING THE COST OF REFUSE COLLECTION. Bulletin No. 10. 31 pp.

REFUSE COLLECTION METHODS. Bulletin No. 11. 55 pp.

REFUSE COLLECTION EQUIPMENT. Bulletin No. 12. 58 pp.

Chicago: American Public Works Association, 1940. Each $.50.

SEX IN DEVELOPMENT. By Carney Landis, et al. New York: Hoeber, 1940. 329 pp. Price, $3.75.

SYPHILIS BY CENSUS TRACTS. March, 1939. Prepared by Howard Whipple Green. Cleveland: Cleveland Health Council, 1940. 20 pp.

TEACHING HEALTH AND SAFETY IN ELEMENTARY GRADES. By Willard Walter Patty. New York: Prentice-Hall, 1940. 271 pp. Price, $2.50.

EMOTION AND CONDUCT IN ADOLESCENCE. By Caroline B. Zachry. New York: Appleton-Century, 1940. 563 pp. Price, $3.00.

TABER'S CYCLOPEDIC MEDICAL DICTIONARY. By Clarence Wilbur Taber. Philadelphia: Davis, 1940. Price, $2.50; thumb ind., $3.00.

CONTROLLED FERTILITY. An Evaluation of Clinic Service. By Regine K. Stix and Frank W. Notestein. Baltimore: Williams & Wilkins, 1940. 201 pp. Price, $3.00.

EMOTIONAL HYGIENE. The Art of Understanding. By Camilla M. Anderson. 2d ed. Philadelphia: Lippincott, 1940. 253 pp. Price, $2.00.

A SURGEON'S LIFE. The Autobiography of J. M. T. Finney. New York: Putnam, 1940. 396 pp. Price, $3.50.

INTRODUCTION TO SOCIAL CASE WORK. By Josephine Strode. New York: Harper, 1940. 219 pp. Price, $2.50.

A GUIDE TO HUMAN PARASITOLOGY. By D. B. Blacklock and T. Southwell. 4th ed. Baltimore: Williams & Wilkins, 1940. 259 pp. Price, $4.00.

VITAMINS. What They Are and How They Can Benefit You. By Henry Borsook. New York: Viking Press, 1940. 193 pp. Price, $2.00.

PRINCIPLES AND PRACTICE OF BACTERIOLOGY. By Major Arthur H. Bryan and Charles G. Bryan. Revised and enlarged. New York: Barnes & Noble, 1940. 410 pp. Paper edition, $1.25.

BOOKS AND REPORTS

Carlos Finlay and Yellow Fever—*By Carlos E. Finlay, M.D. New York: Oxford University Press,* 1940. 249 pp. Price, $4.00.

The chief object of this book is to tell the story of a man who as the result of keen observation, persistent study, experimentation, and careful reasoning conceived the idea that yellow fever, that great plague of tropical countries, was transmitted from man to man through the agency of a mosquito, and who in spite of all discouragement, lack of recognition, and even ridicule, persisted in calling attention to the epidemiological evidence he had collected and to urge destruction of the mosquito to control the disease. Even after his theories were brilliantly proved by the American Commission, headed by Walter Reed, and accepted throughout the world, recognition of the value of Dr. Finlay's work has not been generally adequate.

In 1881 he announced the theory of the transmission of yellow fever by the *Culex,* latter known as the *Stegomyia fasciata,* and now as the *Aëdes aegypti.* Gorgas, in his *Sanitation of Panama,* calls attention to Finlay's acumen in picking out this mosquito from among the five or six hundred varieties in Cuba as the one responsible for carrying yellow fever. Dr. John W. Ross, Medical Director, U. S. Navy, said in 1905, the selection of the *Stegomyia fasciata* " was a work of true genius."

The American Commission, appointed by Surgeon General Sternberg in 1900, consulted Finlay, and he furnished the eggs from which were reared the mosquitoes used by the Commission in the brilliant experiments which settled the matter once and for all, yet in spite of this confirmation of the theories which Finlay had persisted in putting before the public for some 20 years, general recognition of the part he played in unraveling the etiology of yellow fever has not been granted. Finlay was the first to suggest and to carry into practice the use of mosquitoes which had bitten a yellow fever patient within the first 5 days of the disease and then causing them to bite a non-immune, the date being June 30, 1881. He believed that he had been successful in producing yellow fever, but this has been disputed by authorities, such as Carter and the American Commission on technical grounds.

Finlay was attached to the first American Yellow Fever Commission (1879) by the Spanish Governor-General. To their findings, and especially to photomicrographs of blood made from preparations by Sternberg, he ascribed his abandonment of the telluric origin of yellow fever, and led him to the theory of a blood-sucking insect. This was 13 years before Manson put forward his theory concerning the malarial parasite (1894–1896), and 14 years before the conclusive work of Ronald Ross (1895–1897). In 1878 Manson demonstrated the rôle of the mosquito in the transmission of filariae.

The book is a labor of love by a devoted son, who was prompted to write it by Dr. Morton C. Kahn who, in 1936, had the opportunity to look over Finlay's records. He felt that as the material was almost all in Spanish, too little was known in the English-speaking world of the work of Carlos Finlay and his important contributions.

A little more than half of the volume is given to Carlos Finlay and his work, beginning with his family history. The rest considers yellow fever, its distribution, and its influence on the world up to the present, including the discovery of jungle yellow fever. There is a long historical chapter on Origin of Yellow Fever, and the text ends with a Summary of 6 pages. There are 3 Appendices, giving extracts of letters, opinions, and testimonials, a list of papers on yellow fever by Finlay, and a second on other medical and scientific subjects, which shows the wide range of his scientific interests.

The printing and make-up are good. There are a number of interesting photographs, and one plate in color, showing the Medallion and Rosettes given to Finlay by the Cuban Government.

We are glad to note from the Preface that an English translation of the papers by Finlay is being prepared. This has already been too long delayed. The book by his son will be welcomed by all who are interested in medical history and the epidemiology of yellow fever. As well stated in the Foreword: "When one considers the hundreds of years of darkness that preceded this observation, the thousands of victims who perished because no means of control was known, the work of this brilliant, modest Cuban investigator must stand out as one of the world's most important contributions." MAZŸCK P. RAVENEL

Nursing as a Profession—*By Esther Lucile Brown. (2nd ed.) New York: Russell Sage Foundation,* 1940. 152 pp. Price, $.75.

The Russell Sage Foundation has published monographs on certain established or emerging professions including those on social work, law, engineering. This volume is the one on nursing. It represents careful research done in gathering and interpreting data obtained from interviews, questionnaires, books, periodicals, and unpublished studies.

The latest conclusions as to the comparative value and cost of graduate and student nurse service in a hospital; the functions and accomplishments of the four most important national organizations that are interested in standards of nursing and nursing education; the problems of distribution of professional nursing services in various sections of this country; the reasons why large groups of the population do not employ professional nursing services—all these are intensely interesting and vital for one who needs to see the whole scope of nursing today.

Many of the developments and trends in professional nursing are encouraging and show that it is fast taking its place beside the older or more established professions.

This compact, well printed volume is decidedly important, valuable and significant. EVA F. MACDOUGALL

Poisons: Their Isolation and Identification—*By Frank Bamford. Philadelphia: Blakiston,* 1940. 344 pp., 21 ill. Price, $4.00.

As pointed out in the preface, the purpose of this book is to provide a serviceable laboratory manual for the chemist working in toxicological analysis. It is a "practical handbook" rather than a comprehensive treatise on the subject. A knowledge of the chemistry involved in the various tests is assumed, and the discussions of this aspect of the work is meager. Biological effects of poisonous substances, as well as post-mortem signs, are generally well discussed. For a book of this size, there is a surprisingly large number of poisons discussed. This has been accomplished in part by limiting the tests described in detail to those of greatest significance, with others mentioned only by reference. Also a considerable amount of material on alkaloids is con-

densed by presentation in tabular form.

The introduction, devoted to the organization and equipment of a toxicological laboratory, is well done, particularly the discussion of the handling and storage of material for analysis. The part devoted to apparatus might well have included a discussion of various types of extraction apparatus. The material on metallic poisons and on alkaloids is extensive and given in considerable detail. There is some description of the sources of alkaloids with a summary of the physiological effects and the color reaction given in tabular form. Most of Chapter IX is given over to a detailed discussion of the Stas-Otto Process for the isolation of non-volatile organic poisons.

The chapter on Non-Basic Organic Poisons includes brief sections on phenolic poisons, barbiturates, salicylic acid and its derivatives, glycosides, saponins and purgative drugs.

Chapter headings are as follows: Introduction, Classification of Poisons, Volatile Poisons, Metallic Poisons, Corrosive Acids and Alkalis, Non-Volatile Organic Poisons (Alkaloids), Non-Basic Organic Poisons, Isolation of Non-Volatile Poisons, Systematic Scheme for the Identification of Alkaloids, Systematic Testing for Non-Basic Poisons, Miscellaneous Poisons, Drugs of Addiction.

The book can be recommended for the chemist who has had some experience in toxicological analysis and who wants a concise description of the more important features in that field.

H. E. FRENCH

Social Work Engineering: An Outline of Topics for Survey, Planning and Appraisal—*By June Purcell Guild and Arthur Alden Guild. New York: Harper,* 1940. 136 pp. Price, $1.75.

This is an expanded revision of the manual for social workers, *Handbook on Social Work Engineering,* privately published in 1936. Based on practical experience, consideration is given to the integration of private social effort with government spending, the adjustment of programs to meet changing community needs, the development of programs for dealing with dependency, delinquency, health, informal education and recreation, and methods of raising money. The usefulness of the earlier volume promises much for the utilization of this book by those engaged in constructive community planning.

IRA V. HISCOCK

The Troubled Mind: A Study of Nervous and Mental Illnesses—*By C. S. Bluemel, M.D. Baltimore: Williams & Wilkins,* 1938. 520 pp. Price, $3.50.

A Handbook of Elementary Psychobiology and Psychiatry—*By Edward G. Billings, M.D. New York: Macmillan,* 1939. 271 pp. Price, $2.00.

We have here two psychiatric texts as different from each other as a thermometer from a scalpel but serving well their respective purposes—one a popular exposition of the nature and causes of mental and nervous disorders, the other a psychiatric manual for the instruction and guidance of the physician in the understanding and management of these disorders.

Dr. Bluemel offers the general reader a broad orientation to the whole vast field of mental morbidity, in its many aspects and ramifications, beginning with the phenomena of fixed ideas in the normal mind and their more abnormal manifestations in the various phobias, and running through the catalogue of the psychoneuroses, with their numerous physical concomitants, the traumatic hysterias and hysterical paralyses, such miscellaneous disorders as migraine, stammering, alcoholism and drug addiction, with their emotional

components, and the outright psychoses in their standard classifications.

The presentation is on a purely descriptive and symptomatic level, a sort of topography of the land of unreason, profusely illustrated with case histories and elaborated in its recital of clinical details almost to the point of tedium. A saving feature of the book is its simple conversational style, but a little less prolixity and a drastic pruning of the case material to one half its present contents, would have improved considerably its readability.

In spite of its limitations, *The Troubled Mind* is a worth while addition to the as yet meager supply of non-technical books that are needed to enlighten the public with regard to the meaning and significance of one of the major problems of medicine and public health. It is a wholesome treatment of a morbid subject—refreshingly so in its avoidance of the "sexual excesses" of case citations characteristic of so many texts on psychopathology. The layman will learn a lot from this volume and its interesting interpretations of various types of mental maladjustment.

Of a very different sort is Dr. Billings's book, intended primarily for the general medical practitioner and the medical student, but of value also to the specialist in mental and nervous diseases. How valuable it should be to the general physician is obvious from the fact, now widely recognized, that emotional and personality disorders account for a large proportion—estimated at from one-third to one-half—of the clinical problems he is called upon to explain and treat in his everyday practice. Modern psychiatry has not only revolutionized our understanding of the mental disorders, but is also furnishing new and useful concepts of the meaning of disease in general, exemplified by what has become known as "psycho-somatic" medicine, based on a view of the human organism functioning as an integrated biological whole. Dr. Adolf Meyer's formulations, systematized in what he calls "psychobiology," the dominant discipline in American psychiatry today, have contributed largely to the development of this view.

Dr. Billings gives us a lucid and revealing interpretation of this discipline, with all its implications for the understanding of the complex factors of personality functioning in human maladjustments associated with physical as well as mental illnesses. It is a distillation of the principles of psychobiology and scientific psychiatry presented in a way conducive to their practical application as well as theoretical grasp by the average medical practitioner who turns away from the conventional psychiatric texts. It is the result of five years of clinical work and teaching at the Psychiatric Liaison Department of the Colorado General Hospital and the University of Colorado School of Medicine, and derives its peculiar excellence from the author's actual experience with physicians working in all the usual fields of medicine.

The book is divided into five parts. Part I defines psychobiology and explains clearly and compactly the integrated elements that enter into its conceptual and theoretical structure. It lays the foundations for the physician's and student's orientation to the psychiatry that follows. Part II is a guide to psychiatric examination procedures and clinical study. Part III is a discussion of general psychopathology in the light of psychobiological principles, in which the dynamics of normal and abnormal personality functioning in the minor and the major psychoses are interpreted. Part IV describes the general principles of psychotherapy and their special applications. Part V is a bibliography of selected references to the literature of psychiatry, recom-

mended to those who wish to pursue their studies further in this field.

This little volume is an expertly prepared compendium of hard-won knowledge made comparatively easy for the busy practitioner who appreciates the practical import of psychiatry for the more effective conduct of his practice, in whatever branch of medicine he follows. It is worth its weight in therapeutic gold. PAUL O. KOMORA

Industrial Microbiology—*By Samuel Cate Prescott and Cecil Gordon Dunn. New York: McGraw-Hill,* 1940. 541 pp. Price, $5.00.

In this important new book, these well known authors deal with the fundamentals of the utilization of yeasts, bacteria, and molds for the production of industrially important or potentially valuable products. The book considers the organisms, methods of their cultivation, conditions of fermentation, end-products, and biochemistry of the fermentations. Many recent advances in the fermentation industries and in research are discussed.

While for thousands of years mankind has practised domestic arts with the aid of microbes, it was less than a hundred years ago that there was any scientific appreciation of the real part microbes play in the transformations of organic matter, and the subject of industrial microbiology is one of the important outgrowths of fundamental researches conducted by Pasteur who may be regarded as its founder as well as of medical bacteriology and immunology. In 1896, the senior author organized at the Massachusetts Institute of Technology the first course of classroom instruction in industrial biology given in America.

Both the theoretical and practical aspects of fermentation are extensively considered. The work is adapted for fairly advanced students in biology, general bacteriology, and the fundamentals of organic chemistry and biochemistry. Despite its scope, the authors purposely omitted a number of features such as the commercial manufacture of sera, vaccines, and other therapeutic agents, and the culturing of certain organisms, as in butter and cream-ripening, nitrogen-fixation and others, as more intimately related to public health and medicine, or to agricultural and dairy industries.

Of particular interest to industrial hygienists are the multitude of poisonous substances generated by fermentation. These range all the way from aldehydes, acetones, and alcohols through arsenious emanations, esters, oils, fats and lipids, glycerols, pigments, and sulfur compounds to zinc—to mention only a few groups. In fact, the organic compounds in general have numerous sources in these microbic activities. Occasionally the dangers are implied. However, we note one countenanced procedure which should be accompanied with a definite warning, viz., silage tramped down by men in silos, in one of which we once had occasion to investigate four sudden deaths due to the inhalation of air showing marked O_2 deficiency and containing excessive quantities of CO_2 (*J.A.M.A.,* 53:1570–1572 [Oct. 31], 1914).

Some 40 pages are devoted to textile and wood microbiology. There is an Appendix on detergency, disinfection, and sterilization, and another on the treatment and disposal of industrial microbiological wastes. Bibliographical references, some extensive, follow each chapter (with author citations in the combined subject and author index—the last 35 pages of the text). There are also innumerable descriptive and structural formulae and tables, and many illustrations.

A comprehensive work in English such as the present one should be of special interest, not only to the technical groups concerned, but to laboratory workers in

general and physicians located in centers where these fermentation processes engage workers in industrial or commercial procedures.

EMERY R. HAYHURST

Progress in Medicine: A critical review of the last 100 years—*By Iago Galdston, M.D. New York: Knopf,* 1940. 347 pp. Price, $3.00.

Dr. Galdston enjoyed writing this book and it should be read for enjoyment. It tells the story of the last hundred years as seen through the eyes of a psychobiologist with a fondness for metaphysics. A physicist or a chemist would have told a different story, including perhaps the development of x-rays, the discovery of radium, or the contributions which blood chemistry have made to medicine. But such a one would not have devoted 46 pages to hypnotism nor could he have written the chapter on Freud; an essay of rare and sympathetic insight and one which everyone should read who has ever scoffed at the psychoanalysts.

The penultimate chapter, entitled "A Century of Clinical Progress," is devoted very largely to the thesis that clinical progress is unimportant. For one thing, it has made medicine too expensive. And again, if we cure a man of one disease, how do we know he will not soon after die of some other disease? It is much better to prevent his getting any disease. There is a great deal of truth as well as of originality in this chapter. It is true that the public health pioneers of 100 years ago were social reformers driven by a great humanitarian urge. It is true that public health workers today are largely employees of some corporate or official body. But some of the zeal of the pioneers may have been misplaced for all that. Their efforts at "garbage disposal and nuisance abatement" were not as a matter of fact so valuable as our cold-blooded epidemiology. And a man with early tuberculosis today will be more fortunate if he gets an x-ray of his chest than if he is moved into a larger house.

"It is argued" writes Dr. Galdston, "that more and better medical service would gain the people superior health, which, of course, is partially true." This grudging admission unless it is intended for meiosis, probably indicates that Dr. Galdston thinks of "medical service" as curative medicine only. It cannot be overlooked, however, that systems of group practice have made possible a large place for preventive medical service within the unofficial practice of medicine. Indeed the pediatricians have succeeded very well in introducing preventive medicine into the private competitive system. This, in the final chapter, Dr. Galdston recognizes though he rather spoils the effect by an artful but unprofitable effort to distinguish between the prevention of disease and the production of health.

J. ROSSLYN EARP

Report of Industrial Hygiene Sessions, 15th Annual Convention Minutes, Part II—*By the National Battery Manufacturers' Association. Akron, Ohio: Published by the Association,* 1940. 93 pp. Price, $2.00.

The convention was held at Chicago, October, 1939. Contents (and the number of pages devoted to each): Introductory remarks, by L. B. F. Raycroft, 2; Discussion of engineering problems in lead hazard, with tables and forms, by J. J. Bloomfield, 12; Report of survey of lead hazard in the storage battery industry, with tables, forms, illustration, references, and bibliography, by W. C. Dreessen, 15; Respirators and respiratory protections as applied to the lead battery industry, by William P. Yant, 10; Engineering phases of control of lead exposure in small battery plants, by Warren A. Cook, 3; Discussion of recent studies with summary of analytical results cor-

related with chemical data and suggested methods of plant control, with tables and references, by Robert A. Kehoe, presented by Willard Machle, 9; Experience with lead hazard in a group of storage battery plants, with one table, by W. J. McConnell, 2; Lead poisoning in small battery operations, by Carey P. McCord, 2; Adequate medical facilities for control of lead absorption, with two figures and bibliography, by Elston L. Belknap, 5; Case history in compensation claim for lead poisoning, by C. O. Sappington, 3; and Control of lead hazards, with one figure, by H. H. Valiquet, 3.

The last 14 pages are devoted to the 1939 annual convention minutes, comprised of questions, answers and remarks pertaining to the general subject matter, which discusses one of the most important industrial sources of lead poisoning of the present day.

EMERY R. HAYHURST

All the World To See! Twenty-fifth Annual Report—*The National Society for the Prevention of Blindness, Inc. (New York),* 1939. 12 pp.

Well printed, effectively illustrated, and carefully written, this annual report outlines the collaboration with professional groups of wide diversity, having a common interest in the conservation of vision. Doctors, nurses, school teachers, social workers, safety engineers, government and private health agencies, and civic organizations throughout the United States are assisting in the movement for the protection of eyesight.

There are approximately 150,000 blind persons in the United States. "The tragedy in the lives of these individuals and their families is heightened by the fact that blindness is preventable in the majority of cases. . . . The underlying reason for loss of sight, whether it be the result of disease or accident, is usually ignorance."

In view of the fact that more than 16 per cent of the blind population lost their sight as a result of syphilis or gonorrhea, the Society takes an active interest in the problem of venereal disease control. There are 30 states which have premarital examination laws and 17 states which have provisions for compulsory blood tests for expectant mothers.

There are 602 sight-saving classes for the education of school children with seriously defective vision, 15 such classes having been added in 1939. The Society participated in the giving of special courses at five colleges for the training of sight-saving class teachers and supervisors. Research studies and health education are among the other services rendered during the year.

IRA V. HISCOCK

The Diagnosis and Treatment of Pulmonary Tuberculosis—*By John B. Hawes, 2nd, M.D., and Moses J. Stone, M.D. (2nd ed.) Philadelphia: Lea & Febiger,* 1940. 260 pp. Price, $2.75.

If the reader liked the first edition of this compact, concise volume which was published in 1936 he will be even more pleased with this second edition. To be sure, only 45 pages have been added, but the choice of new material and the revision of the old have been made discriminately.

There are two new chapters, one on immunity, resistance and allergy, and the other on the mental aspects of tuberculosis. These are valuable additions, especially in view of the increasing attention being paid in tuberculosis circles to endogenous v. exogenous infection and psycho-somatic influences in disease, respectively.

The sections that have undergone the greatest revision are those on "Roentgen-Ray Diagnosis in Pulmonary Tuberculosis" and "Collapse Therapy."

Although all but two of the chapters

contain lists of selected references for supplementary reading it is regrettable that suggestions for further reading and study have been omitted from the sections on "Specific Treatment of Pulmonary Tuberculosis by Serums, Vaccines and Drugs," and "Mental Aspects of Tuberculosis," on both of which there is interesting material in the literature. Also, the list of references following the chapter on rehabilitation could have been greatly improved by adding publications of more recent vintage, and should have included material on recent coöperative efforts on the part of federal and state bureaus of rehabilitation, tuberculosis sanatoria, and tuberculosis associations, which are pooling their interests to break into the circle of continuity of care for the patient from the time the patient is discovered as being tuberculous until his return to gainful employment.

The publishers maintain in this volume their standard of excellence in the reproduction of the fine diagrams, charts, and x-ray photographs, which were characteristic of the earlier edition.

This publication is recommended as a handbook for ready reference to general practitioners, medical students, nurses, social workers, and health administrators.

BERNARD S. COLEMAN

Text-Book of Public Health—*By W. M. Frazer, M.D., and C. O. Stallybrass, M.D. (formerly by Hope and Stallybrass). (10th ed.) Baltimore: Williams & Wilkins,* 1940. 504 pp. Price, $6.50.

A book which has gone through 10 editions needs little more than an announcement of a revision. The present edition has been considerably enlarged. The Preface gives us a history of this book, which began its life in 1874 in a small way as an addendum to Husband's *Text-book of Forensic Medicine.* Succeeding editions have appeared under several authors and titles, but it was not until the 8th that it assumed its present title under the authorship of Professor Hope. This 10th edition is the first under the present authorship.

The book gives a thorough review of the subject to which it is devoted, almost too concise, however, in some respects. Its chief use for us in America will be as a reference, since, like all English books on public health, it is based on the laws of that country which cover an enormous volume of material, but has fortunately been consolidated to a great extent in the Public Health Act, 1936, the Housing Act, 1936, and the Food and Drugs Act, 1938. Full accounts of these Acts are given in the present text.

The mental attitude of the English at present as well as their necessities is indicated by a chapter on The Medical Aspects of Civil Air Defense. This describes first aid, ambulance service, hospitals, types of bombs, and war gases, with such measures as are possible for the prevention of their evil effects.

The printing and make-up are excellent and the book can be thoroughly recommended for the purposes for which it is intended. There are many well chosen illustrations and charts, and a good index closes the volume.

MAZŸCK P. RAVENEL

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH.D.

First on Your Reading List—Among the young men who will be rejected for the draft there will be 140,000 with tuberculosis, 300,000 with syphilis, many more with other communicable diseases or physical defects. What's to be done for them, and for a dozen related health problems concerned with national defense is discussed in this important state paper.

ANON. Public Health in the National Defense Program. Pub. Health Rep. 55, 39:1760 (Sept. 27), 1940.

Some Very Vital Statistics—Provisional figures of the 1940 Census indicate a rate of increase during the last decade less than half any previous decade since the first census in 1790. In no previous decade have more than 3 states declined in population. Now there are 6. City growth rates, too, showed a sharp decline.

ANON. Preliminary 1940 Population Figures for the United States by States. Pub. Health Rep. 55, 42:1879 (Oct. 18), 1940.

Pregnancy Is Not Pathological—You would suppose the British sanitarians would be so preoccupied with air raid casualties that they would have little thought for ordinary matters, but in this editorial you will find the germ of an idea that may have some application on this more tranquil side of the water. It is this: though the case for antenatal supervision is strong, is there not danger that our prevention-of-excessive-maternal-mortality approach to prenatal hygiene may influence the expectant mother's attitude, causing her to think of her pregnancy as pathological rather than a perfectly natural physiologic condition? Pelvic measurements, frequent specimen analyses, and excessive goings-over may create groundless fear rather than reassurance.

ANON. The Psychology of Pregnancy. Med. Off. 40, 4:38 (July), 1940.

Health of the Worker—Industrial hygiene has much to contribute to national defense by conserving and developing skilled workers, preventing lost time, and increasing efficiency. Some of the things that remain to be done if this desirable goal is to be achieved are discussed in wholesome detail in this paper read at the Detroit meeting.

BRISTOL, L. D. Industrial Health and National Defense. J.A.M.A. 115, 15:1236 (Oct. 12), 1940.

Health Museums Urged—Careful surveys of consumer reactions lead to the belief that the World's Fair Hall of Man was a useful and effective means of large scale health education. Hence it is proposed that museums situated throughout the country be created to do for all what was done for the 7,500,000 who visited the Medicine and Public Health Building.

CALVER, H. C. Health Information, Please. J.A.M.A. 115, 15:1251 (Oct. 12), 1940.

More about Our National Evolution—Convincing reasons why social insurance is the soundest method of providing security in old age make notable this first of three final papers of the Round Table on Population Problems. The other two, on the effect of population trends on public health and social welfare are also not to be missed. You may remember that the first three papers were mentioned in the September bibliography (q. v.).

CLAGUE, E. The Aging Population and Programs of Security (and two related papers). Milbank Quart. 18, 4:345 (Oct.), 1940.

Lay Help in Telling the World—Citizen committees to disseminate information about official public health programs are discussed. The staff must be convinced that laymen can help; there must be a careful and intelligent selection of members; there must be a formal organization; and the committee must be given freedom of effort, this writer suggests.

DAVIS, E. K. Citizen Committees in Official Agencies. Pub. Health Nurs. 32, 10:588 (Oct.), 1940.

Food for Smokers' Thoughts—It is probable that smoking has an effect on younger people, influencing perhaps the earlier development of coronary disease. In old people the arterial changes go on regardless of the possible harm of tobacco smoke. A greater incidence of coronary disease among people under 50 was found in smokers than among non-smokers, and it was greatest among the heavy smokers.

ENGLISH, J. P., *et al.* Tobacco and Coronary Disease. J.A.M.A. 115, 16:1327 (Oct. 19), 1940.

Cleanliness through the Ages—About 2,000 years B.C., the Minoans made bath tubs remarkably like our own and perhaps more artistically decorated. There are many more historical facts about sanitary practices in this brief paper which is commended to all who have any curiosity whatever about the sources of our *own* sanitary mores.

GRAY, H. F. Sewerage in Ancient and Medieval Times. Sewage Works J. 12, 5:939 (Sept.), 1940.

When Air Sirens Wail—Among the health administrative jobs following air raids are the training of personnel for decontamination work and to determine the suitability for habitation of the damaged dwellings. First aid for casualties is part of the British H. O.'s job. It's devoutly to be hoped that American sanitarians will never have more than an academic interest in these problems.

HAY, C. P. The Public Health Department and Air Raid Precautions. Med. Off. 40, 4:41 (July 23), 1940.

Revival of a Hardy Perennial—Venereal disease health education should include explicit directions about chemical and mechanical prophylaxis. Civilian as well as military authorities should provide preventive facilities. Research should be continued. These are the conclusions of a distinguished committee.

HAZEN, H. H., *et al.* The Chemical and Mechanical Prevention of Syphilis and Gonorrhea. J.A.M.A. 115, 14:1185 (Oct. 5), 1940.

Plain Talk about Tonsils—About one child in five has tonsils so grossly hypertrophied or chronically diseased that they adversely affect his well-being and, of course, should be removed. On the other hand, there is little or no evidence that colds, laryngitis, otitis media, bronchitis, pneumonia, or tuberculosis is reduced among tonsillectomized children. Tonsils are not often responsible for pulmonary infections. Hence the conclusion that tonsils are not the menace to the child's health that has been so frequently suggested. The moral need not be labored here.

KAISER, A. D. Significance of the Tonsils in the Development of the Child. J.A.M.A. 115, 14:1152 (Oct. 5), 1940.

A Grain of Salt—In this controlled demonstration it was found that the eating of gelatin had no effect upon the ability of human muscles to perform work. As the usual dietary of protein is quite adequate, there is no reason to assume that more in the form of gelatin will do any good despite what you read in the back of the best magazines.

MAISON, G. L. Failure of Gelatin or

Aminoacetic Acid to Increase the Work Ability. J.A.M.A. 115, 17:1439 (Oct. 26), 1940.

From Thoreau to Thoracoplasty—Briefly surveyed is the whole history of the progress of the tuberculosis control movement as an introduction to an excellent statement of the present-day medical responsibilities in case finding, treatment, and rehabilitation.

MILLER, J. A. The Drama of Tuberculosis. J.A.M.A. 115, 15:1272 (Oct. 12), 1940.

Vitamins A to D—Included in this discussion of the food sources of the most important vitamins are a new and useful list of the vitamin values of the common foodstuffs and a table of suggested daily requirements for vitamin A, thiamin chloride, riboflavin, ascorbic acid, and vitamin D.

MUNSELL, H. E. Vitamins and Their Occurrence in Foods. Milbank Quart. 18, 4:311 (Oct.), 1940.

For Proud Spirits—Tuberculosis, as a disease entity, is young when it first encounters a new population, it matures when it becomes fairly universal and grows senescent when the population becomes sufficiently resistant to cause a drop in the death rate. The dying out of the most susceptible families is one factor in this end. This thesis is a wholesome one for the complacent health worker to ponder upon when he is inclined to assume too much credit for the declining tuberculosis death rate.

PINNER, M. Epidemiological Trends of Tuberculosis. Am. Rev. Tuberc. 42, 3:382 (Sept.), 1940.

An Occupational Disease—Semi-annual chest x-rays of student nurses, annual examinations for graduate nurses, and testing of all patients on admission would answer the serious problem of tuberculosis among nurses. In Bellevue it appears that primary infection is no more frequent in nurses on the tuberculosis wards than among those on the other services. Here is discussion that comes close home to many public health administrators.

RIGGINS, H. McL., and AMBERSON, J. B., JR. The Detection and Control of Tuberculosis Among Nurses. Am. J. Nurs. 40, 10:1137 (Oct.), 1940.

Timely Articles about Respiratory Diseases—Four exceedingly able papers deal, in turn, with the common cold, sinusitis as it affects other respiratory infections, the relationships of primary and reinfective types of tuberculosis, and the highly successful drug treatment of pneumonia. All four papers are brief but inclusive and are a decided "must" on your reading list.

SMILLIE, W. G., *et al.* Symposium on Infections of the Respiratory Tract. New Eng. J. Med. 223, 17:651 (Oct. 24), 1940.

Why Children Fail to Grow—Children in some of the lower school grades who had failed to gain weight for three successive months were studied to determine the probable contributing cause. Recent illness was found in 70 per cent; 8 per cent got insufficient sleep and 67 per cent insufficient calories. "Normal" weight children are as likely to show intermittency in growth as are under- or over-weights.

TURNER, C. E., *et al.* A Study of the Health of Children Showing Intermittency in Growth. J. School Health, 10, 8:228 (Oct.), 1940.

Syphilitics under Treatment—Some statistics to ponder over: with a persistent attack rate of 2 per 1,000, at least one adult in ten will acquire syphilis at some time; half the existing syphilis infections were acquired before age 25 and most of these in the teens. These are only two of the many significant findings of a Washington, D. C., study.

USILTON, L. J., and RUHLAND, G. C. Survey of Venereal Diseases in the District of Columbia. Ven. Dis. Inform. 21, 8:244 (Aug.), 1940.

ASSOCIATION NEWS

APPLICANTS FOR MEMBERSHIP

The following individuals have applied for membership in the Association. They have requested affiliation with the sections indicated.

Health Officers Section

F. T. Andrews, M.D., Bay County Health Dept., Bay City, Mich., Director

Joseph H. Galia, M.D., M.P.H., 1196 East 9th St., Eddystone, Pa., Dist. Medical Director, State Dept of Health

W. F. McCarthy, M.D., Jackson County Health Dept., Independence, Mo., Health Officer

J. W. Podezwa, M.D., 9701 Jos. Campau Ave., Detroit, Mich., Health Officer, City of Hamtramck

Winston B. Prothro, M.D., Clarke County Health Unit, Arkadelphia, Ark., Director, Health Dist. 3.

Laboratory Section

Goswin Karmann, B.S., Instituto Butantan, Caixa Postal 65, Sao Paulo, Brazil, S. A., Asst. Chemist, Drug Control Laboratory, Public Health Dept.

Henry M. Kawano, B.S., 612 E. Madison St., Ann Arbor, Mich., Sanitary Inspector, Territorial Board of Health

Edwin O. Wicks, Dr.P.H., Box 1050, Bismarck, N. D., Bacteriologist, State Dept. of Health

Engineering Section

Herbert A. Anderson, B.S., Rhinelander, Wis., Asst. State Sanitary Engineer, State Board of Health

Bernard B. Berger, B.S., 124 Packard St., S.E., Grand Rapids, Mich., Sanitary Engineer, Kent County Health Dept.

William D. McIlvaine, Jr., M.S., Box 3598, St. Paul, Minn., Asst. Engineer, Minneapolis-St. Paul Sanitary District

Henry O. Strohecker, Jr., B.S., 228 Church St., Swainsboro, Ga., Asst. Public Health Engineer, State Health Dept.

Industrial Hygiene Section

Miles M. Bruno, B.S., 1116 Iroquois, Detroit, Mich., Bacteriologist, Frederick S. Stearns & Co.

William E. Crutchfield, Jr., Ph.B., Kettering Laboratory, Cincinnati, Ohio, Research Asst.

Matthew C. Hong, B.A., 521 E. Jefferson St., Ann Arbor, Mich., Industrial Hygienist, Territorial Board of Health, Hawaii

Mark M. Schapiro, M.D., 5498 Hyde Park Blvd., Chicago, Ill., Medical Dept., Marshall Field & Co.

Oliver G. Stam, 205 Hillside Ave., Glen Ridge, N. J., Industrial Hygienist, Fidelity & Casualty Ins. Co.

Food and Nutrition Section

Bertha Holman, E. Harlem Dental & Nutrition Service, 35–43 E. 125th St., New York, N. Y., Nutritionist, Community Service Socty.

Pauline Beery Mack, Ph.D., Textile Chemistry Bldg., State College, Pa., Director, Home Economics Research

William E. Pearce. M.S., Research Dept., American Can Co., Maywood, Ill., Chief, Sales Research Div.

Myra Reagan, M.S., State Board of Health, Columbia, S. C., Nutrition Consultant, Maternal and Child Hygiene Div.

Grace Hood Sanders, M.S., 133 West Hillvale, Knoxville, Tenn., Director, Div. of Health Education, Bureau of Health

Elisabeth L. Whipple, Michigan Dept. of Health, Lansing, Mich., Nutritionist, Bureau of Maternal and Child Hygiene

Maternal and Child Health Section

James T. Bell, M.D., 800 N. E. 24th St., Oklahoma City, Okla., Director, Bureau of Maternal and Child Health, State Health Dept.

Isador Dyer, M.D., Box 297, Tahlequah, Okla., Consultant Obstetrician, State Health Dept.

Edith Lowry, M.D., 316 W. Main, St. Charles, Ill., Writer on Child Health Education

Earl W. May, M.D., 541 David Whitney Bldg., Detroit, Mich., Chief Pediatrician, Herman Kiefer Hosp.

Frederick B. Miner, M.D., 400 Sherman Bldg., Flint, Mich., Physician

Maria Oliver, 2590 Pie IX Blvd., Apt. I, Montreal, Que., Canada, Dist. Supervisor, Child Hygiene Div., Health Dept.

Maxine Turner, Okla. State Health Dept., Oklahoma City, Okla., Consulting Nutritionist

Public Health Education Section

Leslie S. Baker, American Museum of Health, Room 253, Press & Promotion Bldg., World's Fair, N. Y., Administrative Asst.

Jubie Barton Bragg, Jr., B.S., 1005 East Catherine St., Ann Arbor, Mich., Student, Univ. of Michigan

Leland H. Evans, D.D.S., East Quad., Hinsdale House, Ann Arbor, Mich., Student, Public Health Dentistry, Univ. of Michigan

Harwin M. Hunsley, 718 West King St., Decatur, Ill., Asst. to Director of Scientific Exhibit, American Medical Assn.

I'Anna Jontz, M.A., R.N., Illinois State Normal Univ., Normal, Ill, Instructor in Health Education and Univ. Nurse

Edna M. Kech, A.B., 1221 12th Ave., Altoona, Pa., Director of Health Education, State Dept. of Health

Dorothy McDonald, M.D., C.P.H., State Board of Health, Madison, Wis., Adviser on School Health

Basil O'Connor, LL.B., 120 Broadway, New York, N. Y., President, National Foundation for Infantile Paralysis, Inc.

Sidney Oviatt, B.A., W. K. Kellogg Foundation, Battle Creek, Mich., Director of Publications

Elizabeth Chant Robertson, M.D., Ph.D., 503 Davenport Rd., Toronto, Ont., Canada, Research Fellow, Dept. of Pediatrics, Univ. of Toronto

Helen M. Starr, 159 Women's Gym., Univ. of Minnesota, Minneapolis, Minn. Asst. Professor of Physical Education

Doris L. Teachout, M.S., 259 N. Market St., Marine City, Mich., Director of Health & Physical Education, Marine City High School

Layton E. Thompson, M.A., 701 Blair St., Flint, Mich., Executive Secretary, Genesee County Tuberculosis Assn.

Public Health Nursing Section

Viola S. Busey, R.N., 410 Geneva St., Elkhorn, Wis., Walworth County Public Health Nurse

Ruth M. Dahlgren, B.A., R.N., Iron County Health Dept., Stambaugh, Mich., Public Health Nurse

Doris Kerwin, 1018 N. Jefferson St., Milwaukee, Wis., Director, Nursing Dept., Wisconsin Anti-Tuberculosis Assn.

Mary M. Klaes, R.N., R. D. 2, Dover, Dela., Nursing Consultant, Crippled Children's Services, State Board of Health

Muriel E. Larson, B.A., Florence, Wis., Florence County Nurse

Jessie E. S. MacDonald, R.N., P. O. Box 245, Crandon, Wis., Forest County Public Health Nurse

Eleanor W. Mumford, B.S., R.N., 357 Lincoln Ave., Orange, N. J., Associate for Nursing Activities, National Socty. for Prevention of Blindness

Ruth J. Oakes, B.S., 893 W. Euclid St., Detroit, Mich., Field Supervisor, Dept. of Health

Katherine A. Ott, B.S., 607 E. Mulberry St., Kokomo, Ind., Orthopedic Field Nurse, State Dept. of Public Welfare

Elisabeth Cogswell Phillips, M.A., 262 Madison Ave., New York, N. Y., Educational Asst., Henry Street Visiting Nurse Service

Helen E. Stokes, R.N., 51 W. Delaware Place, Chicago, Ill., Supervising Field Nurse, Dept. of Health

Catherine Sundstrom, Eagle River, Wis., Vilas County Nurse

Audie C. Wilkinson, R.N., Philip, S. D., Dist. Supervisor, State Board of Health

Frona A. Yeager, R.N., 512 N. Walnut St., Danville, Ill., Director of Nurses, Child Welfare Assn.

Unaffiliated

Mary S. Batchelor, State Board of Health, Raleigh, N. C., Field Representative, Div. of County Health Work

H. Moreland Emerson, D.D.S., Fifth Ave. Bldg., Moline, Ill., Asst. Dentist, Div. of Dental Health Education, State Health Dept.

Frank J. Houghton, D.D.S., Jersey City Medical Center, Jersey City, N. J., Director of Dental Clinics

DECEASED MEMBER

Prof. Robert E. Chaddock, Ph.D., New York, N Y., Elected Member 1915, Elected Fellow 1922

The Sedgwick Memorial Medal

AT the Detroit Annual Meeting, the presentation of the Sedgwick Memorial Medal was made by Milton J. Rosenau, M.D., whose citation was as follows:

"The Sedgwick Memorial Medal this year is conferred on Dr. Hans Zinsser. The satisfaction one usually has in conferring an honor to a colleague is marred this time by the fact that it must be conferred posthumously.



Hans Zinsser, M.D.

"Dr. Hans Zinsser was a gem with many facets. He was an inspiring teacher, a notable scientist, a forward leader, a distinguished author, an active patriot, a free liberal, a wide traveler, a colorful personality, a royal sportsman, a sensitive poet and a brave soul.

"A sonnet he wrote when he knew his days were numbered has the calm, joyful attitude of the happy warrior. He wrote:

"'Now is death merciful. He calls me hence
Gently, with friendly soothing of my fears
Of ugly age and feeble impotence
And cruel disintegration of slow years.
Nor does he leap upon me unaware
Like some wild beast that hungers for its prey,
But gives me kindly warning to prepare:
Before I go, to kiss your tears away.
How sweet the summer! And the autumn shone
Late warmth within our hearts as in the sky,
Ripening rich harvest that our love had sown.
How good that 'ere the winter comes, I die!
Then, ageless, in your heart I'll come to rest
Serene and proud, as when you loved me best.'"

In accepting the medal from Dr. Rosenau, Dr. Haven Emerson made the following acknowledgment:

"On behalf of Hans Zinsser's wife and children, it is my very precious privilege to receive this enduring token of the admiration and affection of the multitude of humble workers in preventive medicine for whom his life was an inspiration.

"In his enchanting spirit of fellowship he wrote but a few months ago of his happiness in planning to attend this meeting to receive the Sedgwick Memorial Medal in person.

"No man ever left behind him from the very midst of high endeavor for his fellow man, so vivid a sense of his continuing presence among us."

EMPLOYMENT SERVICE

The Association Employment Service seeks to bring to the attention of appointing officers the names of qualified public health personnel and to act as a clearinghouse on employment. This is a service of the Association conducted without expense to employer or employee.

From the registry of persons available, selected announcements are published from time to time. Appointing officers may obtain lists of all registrants on request.

Positions Available

Assistant Epidemiologist—Qualified to give special attention to medical aspects of industrial hygiene, epidemiologic investigation and preventable disease; midwestern state department of health; salary $3,600 plus travel allowance. W470

Dental Hygienist—on field staff of eastern state health bureau; salary $1,500 per annum plus travel allowance; must be graduate of reputable dental hygiene school and have training in education and public health. W471

Positions Wanted

ADMINISTRATIVE

Experienced physician, graduate University of Illinois; M.P.H., Johns Hopkins, 1940; seeks administrative opening suitable to his proven ability. Excellent references. A466

Physician, 33; M.D., 1936; postgraduate course in venereal disease control, experienced as district health officer and in organizing and publicizing syphilis control campaign; now employed in charge venereal disease clinics in metropolitan health department; seeks venereal disease control post with opportunity to organize or administer program. A437

A position in epidemiology or administrative public health is desired by physician with C.P.H. from Johns Hopkins, 11 years' administrative public health experience, and excellent background of communicable disease control and school health service. A368

Physician, aged 43, interested in public health career, seeks full-time position as city or county health officer or school physician; 4 years' experience in New York State. P.O. Box 695, Kingston, N. Y.

Physician, M.D., Yale; M.S.P.H., Columbia; also short course for health officers, Vanderbilt; good clinical background; 3 years' public health experience; will consider appointment in child health, epidemiology or public health administration. A350

Physician, M.D., University of Cincinnati; with postgraduate training in venereal disease control, Johns Hopkins; is available as venereal disease control officer. A363

Physician, M.P.H., Harvard; well experienced in city and rural health administration, will consider appointment as district health officer or in city or state health department. A418

Woman physician, M.D., Cornell; M.P.H., Harvard; experienced in pediatrics; seeks administrative position. A467

Woman physician, graduate of University of Iowa, experienced as director of state bureau of maternal and child health, as well as health service director, seeks teaching position. A318

HEALTH EDUCATION

Well qualified woman physician, M.A. and M.D. from Stanford, with 6 years' experience in nationally known secondary school in health education and medical advisory duties, wishes position in college health work. H448

Young woman with splendid educational background, graduate of Massachusetts Institute of Technology health education courses; M.A., Columbia University, seeks position in health education or nutrition. H462

LABORATORY

Physician, C.P.H., Harvard-Technology; experienced as bacteriologist and pathologist and director of state laboratories; desires position. L208

Teaching, executive or administrative position desired by experienced teacher in bacteriology and public health; Ph.D., Cornell; now professor in grade A medical school. L327

Experienced woman bacteriologist, Ph. D., University of Illinois, 1937, wishes position in teaching or research. Excellent bibliography and references. L410

Experienced bacteriologist, young man of 33, Sc.B., who for several years has been in charge of state laboratory doing public health and diagnostic bacteriology, immunology and serology, will consider opening. L427

Bacteriologist, serologist, B.S., M.A. degrees; 2 years' experience foods, dairy and biochemistry in public health laboratory, desires position in research or routine. L454

MISCELLANEOUS

Industrial hygiene chemist, experienced in sampling, analysis of toxic industrial gases and fumes; petrographic dust analysis; dust counting; general toxicological analysis; chemical microscopy; also experienced in making industrial hygiene surveys; with knowledge of German, French, and Spanish; 4 years' experience; desires position. I457

Woman physician, with excellent medical training, experienced in maternal and child health and in generalized public health work, seeks position. C376

Advertisement

Opportunities Available

COUNTY HEALTH PHYSICIANS—(a) Young physician willing to locate in rural south; county now has four physicians to serve population of over 12,000; $3,500 annually for services to specific group; privilege of building outside practice. (b) Assistant county physician; recent graduate, unmarried, preferred; $125, maintenance, increasing to $150; California. (c) County health physician; experience must have included one year's experience general practice, one year's full-time experience in general public health work; training must have included minimum two quarters in approved school of public health; vicinity $4,200; East. (d) Several vacancies in South; training available for men interested in but lacking formal public health background; initial salaries around $3,000 plus travel allowance. PH 12–1, Medical Bureau (M. Burneice Larson, Director), Palmolive Building, Chicago.

CITY HEALTH PHYSICIANS — (a) Virgin Islands; young married physician required; $2,400. (b) City of 10,000; will be in charge newly organized department consisting of full-time nurse, full-time sanitary officer, both directly under supervision of city physician; some public health training advantageous. $3,000, increasing; East. PH 12–2, Medical Bureau (M. Burneice Larson, Director), Palmolive Building, Chicago.

YOUNG PHYSICIAN—Qualified to serve as chief of syphilis unit in municipal social hygiene clinic; minimum two years' experience in syphilis work required, preferably with teaching experience included; about $3,600, subject to increase. PH 12–3, Medical Bureau (M. Burneice Larson, Director), Palmolive Building, Chicago.

ASSOCIATE DIRECTOR, SCHOOL OF PUBLIC HEALTH — Young physician with public health teaching experience to serve as associate director in school of public health, approved university medical school; Master's or Doctor's degree in Public Health required; $4,000, increasing. PH 12–4, Medical Bureau (M. Burneice Larson, Director), Palmolive Building, Chicago.

PUBLIC HEALTH PHYSICIAN—For staff appointment in university school of public health; young man with degree in public health and successful experience in county health administration required; advantageous if interested particularly in epidemiology; salary open to discussion. PH 12–5, Medical Bureau (M. Burneice Larson, Director), Palmolive Building, Chicago.

STUDENT HEALTH RESIDENCIES—Several to replace residents called for active service in National Defense Program; $1,200, maintenance; large university. PH 12–6, Medical Bureau (M. Burneice Larson, Director), Palmolive Building, Chicago.

STUDENT HEALTH PHYSICIAN — Two-year fellowship available in eastern university; program will include teaching, some resident duties, clinical and research activities; first year, $1,500, maintenance; second year, $1,725, maintenance or $2,250 without maintenance; duties will begin immediately. PH 12–7, Medical Bureau (M. Burneice Larson, Director), Palmolive Building, Chicago.

PUBLIC HEALTH NURSE EXECUTIVES—(a) Certified public health nurse with minimum Bachelor's degree to serve as consultant and educational director in state department of health; particular concern will be department of maternal and child health; $200 plus travel allowance. (b) Graduate nurse with B.S., C.P.H. and preferably M.S. degrees for public health instructorship, university school of nursing; theoretical preparation must have been supplemented by several years of public health nursing experience; salary adequate to secure services of best qualified applicant. (c) Public health nurse with some social service training for interesting staff appointment; large children's hospital. (d) Public health nurse with degree and some supervising experience for appointment as supervisor in county health department; 8 nurses on staff; entrance stipend $1,700. PH 12–8, Medical Bureau (M. Burneice Larson, Director), Palmolive Building, Chicago.

PUBLIC HEALTH NURSES—(a) County department of health; minimum fifteen credits in advanced public health training required; $1,500 plus $300 travel allowance; year-round appointments; duties begin January 1, 1941. (b) School health nurse; must have C.P.H. degree; duties will begin immediately; about $150, including car allowance, after first of year; must be under 45, midsouthern city. (c) Public health nurse with Bachelor's degree capable teaching a generalized program to student nurses; $150 plus $35 car maintenance; central metropolis. (d) Public health nurse qualified to direct county-wide tuberculosis educational program; Illinois. PH 12–9, Medical Bureau (M. Burneice Larson, Director), Palmolive Building, Chicago.

OUTPATIENT DEPARTMENT SUPERVISORS —(a) General hospital, fully approved, needs outpatient department supervisor who has had background in public health nursing; opportunity to completely reorganize department as hospital is increasing bed capacity to nearly 300; location particularly attractive to someone desiring to combine friendly small city atmosphere with accessibility to large metropolis. (b) Fully approved 200 bed hospital; department occupies ground floor space in light, sunny part of hospital building; experienced public health nurse desired for appointment as supervisor; salary open to discussion. PH 12-10, Medical Bureau (M. Burneice Larson, Director), Palmolive Building, Chicago.

LABORATORY TECHNICIAN — Full-time appointment, state department of health; special training in technic of Kahn test for syphilis essential; duties will begin at once; entrance stipend $125. PH 12-11, Medical Bureau (M. Burneice Larson, Director), Palmolive Building, Chicago.

Situations Wanted

PUBLIC HEALTH PHYSICIAN — Young physician is available for public health appointment; B.S., M.D., M.P.H. (*cum laude*) degrees; several years rural health officer; 2 years, field epidemiologist; now completing graduate training in tuberculosis work; for further information please write M. Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago.

PUBLIC HEALTH NURSE—B. S., Columbia; graduate of New England training school; nearly 15 years' experience in public health nursing and social service work; 9 years, executive secretary and director of nursing, important organization; for further information please write M. Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago.

BACTERIOLOGIST — B.S., M.A., Ph.D., large university; splendid experience in teaching and research; 8 years, serologist, large hospital, metropolitan area; for further information please write M. Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago.

NEWS FROM THE FIELD

MENTAL HOSPITAL SURVEY BOARD

AN unofficial commission, headed by Homer Folks, Secretary of the State Charities Aid Association, was appointed on November 9 by Governor Herbert H. Lehman to make a survey of ways and means of reducing both the number of admissions to and the increasing population of New York State's mental institutions.

Outlining the matters for special studies which will be assigned to the commission, the Governor listed:

1. Newer modes of treatment — namely, insulin, metrazol and possibly other types of shock treatment.
2. The relation, present and future, of syphilis control to hospital census.
3. Increased and earlier use of parole.
4. Outside care, with payment for board, of a larger number of patients.
5. General matters of hospital administration.

In addition to Mr. Folks, chairman, those invited to serve on the commission, and listed by the Governor as experts in the field, are:

Dr. Karl M. Bowman
Dr. Clarence O. Cheney
Hester B. Crutcher
Stanley P. Davies
Dr. William J. Tiffany
Dr. Lawrence Kolb
Dr. Frederick W. Parsons
Dr. William L. Russell
Dr. Nolan D. C. Lewis
Dr. George S. Stevenson

The total inmate population of the state mental institutions, of which there are 27, is now about 90,000, and the cost of operation totals nearly $34,000,000 a year. The total inmate population has increased steadily from 64,294 in 1932 to its present peak.

GERONTOLOGY CONFERENCE

DR. THOMAS PARRAN, Surgeon General of the U. S. Public Health Service, has called a two day conference of the National Advisory Committee on Gerontology. The committee will consider the increasing significance of the older individuals in the national economy and defense growing out of the conspicuous shift to greater age in the population.

The Advisory Committee on Gerontology includes the following:

Dr. L. R. Thompson, Director, National Institute of Health, U. S. Public Health Service
Dr. Anton J. Carlson, Physiologist, University of Chicago
Dr. Charles L. Christiernin, Medical Director, Metropolitan Life Insurance Company; Association of Life Insurance Medical Directors of America
Dr. Robert E. Coker, Zoölogist, National Research Council, University of North Carolina
Dr. William Crocker, Botanist, Boyce Thompson Institute of Plant Research
Lawrence K. Frank, Sociologist, Josiah Macy Jr. Foundation
Dr. A. Baird Hastings, Biochemist, Harvard University
Dr. Ludvig Hektoen, Pathologist, Consultant, National Cancer Institute, U. S. Public Health Service
Dr. Winfred Overholser, Psychiatrist, Superintendent, St. Elizabeths Hospital
Dr. Clarence Selby, Industrial Physician, General Motors Corp.
Dr. William D. Stroud, Clinician, Philadelphia

BUREAU OF ANIMAL INDUSTRY CHANGES

THE Biochemical Division of the Bureau of Animal Industry of the U. S. Department of Agriculture has been merged with the Pathologic Division and the Animal Nutrition Division. The position of Chief of the Biochemical Division has not been filled since the recent death of Robert M. Chapin. Activities of the division relating to animal diseases were transferred to the Pathologic Division and those relating to the nutritive value of animal products were assigned to the Animal Nutrition Division, at the Beltsville Research Center, Beltsville, Md.

BUILDING HEALTH FOR DEFENSE

PRESIDENT ROOSEVELT, speaking on October 31 at the dedication of the new National Health Institute in Bethesda, Md., said:

> The total defense which this nation seeks involves a great deal more than building airplanes, ships, guns and bombs. We cannot be a strong nation unless we are a healthy nation. And so we must recruit not only men and materials but also knowledge and science in the service of national strength.
>
> The Public Health Service is a very old institution and has done magnificent work, but it is only recently that the Federal Government has indicated that it can do infinitely more—that disease disregards state lines as well as national lines—that among the states there is as we know an inequality of opportunity for health.
>
> Now that we are less than a day by plane from the jungle-type yellow fever of South America, less than two days from the sleeping sickness of Equatorial Africa, less than three days from cholera and bubonic plague, the ramparts we watch must be civilian in addition to military.

The President expressed thanks to Mr. and Mrs. Luke Wilson for having donated the grounds on which the Institute is situated, pointing out that it came as a gift to the nation in 1935.

NEW PRESIDENT AND DIRECTOR OF KELLOGG FOUNDATION

IT has been announced that George B. Darling, Dr.P.H., Associate Director, and Emory W. Morris, D.D.S., Associate Executive Director, were elected President, and General Director, respectively, of the W. K. Kellogg Foundation, Battle Creek, Mich., succeeding the late Dr. Stuart Pritchard, who held both positions.

The Foundation has announced a large program for the coming year to further the health and well-being of children, and the greater part of the work will be done in the Counties of Calhoun, Allegan, VanBuren, Barry, Branch, Eaton, and Hillsdale, where the Foundation conducts community health projects.

MEMORIAL TO DR. LAZEAR

WASHINGTON and Jefferson College, Washington, Pa., according to *Science*, dedicated on October 26 a new building for chemistry to the memory of Dr. Jesse W. Lazear who died in Cuba in 1900 of yellow fever while serving as a member of the Yellow Fever Commission in the U. S. Army. Dr. Lazear was an alumnus of the College. John R. Kissinger of Huntington, Ind., and John J. Moran of Havana, Cuba, two of the group of soldiers who allowed themselves to be bitten by mosquitoes during the investigation, were guests at the dedication ceremony.

AMERICAN SCHOOL HEALTH ASSOCIATION OFFICERS

THE American School Health Association has recently elected the following officers:

President, Amos L. Beaghler, M.D., Denver, Colo.
President-elect, Earl E. Kleinschmidt, M.D., Chicago, Ill.
Vice-Presidents, Helen A. Cary, M.D., Portland, Ore.; Lon W. Morrey, D.D.S., Chicago, Ill.
Executive Secretary-Treasurer, A. O. DeWeese, M.D., Kent State University, Kent, Ohio
Editor-in-Chief, Charles H. Keene, M.D., University of Buffalo, Buffalo, N. Y.

NEW JERSEY HEALTH AND SANITARY ASSOCIATION ELECTS NEW OFFICERS

NEW officers elected at the 66th Annual Meeting of the New Jersey Health and Sanitary Association, Inc., held November 15–16 at Asbury Park, N. J., are as follows:

President—L. VanD. Chandler, Hackensack
1st Vice-President—Joseph E. Raycroft, M.D., Princeton
2nd Vice-President—H. F. Kilander, Ph.D., East Orange
3rd Vice-President—Joseph H. Kler, M.D., New Brunswick
Secretary—Edward Guion, M.D., Northfield
Treasurer—Budd H. Obert, Asbury Park
Executive Secretary—John Hall, Freehold

DR. STAMPAR IN YUGOSLAVIA

THE friends of Dr. A. Stampar, formerly of the staff of the Health Section, League of Nations, will be interested to know that he is now Dean of the Medical School and President of the Student's Social and Health Services at Zagreb, Gvozd, Yugoslavia. He reports that Yugoslavia's health institutions have been kept alive during the present uncertain period. Dr. Stampar reports an acute lack of current information about medicine and public health in other countries.

PERSONALS

Eastern States

DR. JOHN W. CHAMBERLAIN, of Belmont, Mass., has been appointed Assistant Director of the Department of Hygiene at the Massachusetts Institute of Technology, Cambridge. He has been an assistant in the Department since 1937.

GEORGE LYNDE GATELY, M.D.,† of Boston, Mass., has been appointed Commissioner of Health of Boston, effective November 1, succeeding HENRY F. R. WATTS, M.D., resigned. Dr. Gately is a graduate of Tufts Medical School and has completed courses in public health at the Massachusetts Institute of Technology.

JOHN G. HARDENBERGH, V.M.D.,† has resigned as Director of Laboratories of the Walker-Gordon Laboratory Company, Inc., Plainsboro, N. J., with whom he has been associated since 1927. On January 1, 1941, he will become Executive Secretary of the American Veterinary Medical Association, with headquarters at 600 South Michigan Avenue, Chicago, Ill.

ALFRED KESSLER, M.S.P.H., a recent graduate from the DeLamar Institute of Public Health, Columbia University, New York, N. Y., has been appointed in health education with the Queensboro Tuberculosis & Public Health Association, New York, N. Y.

RALPH F. SIKES, M.D.,† formerly with the Connecticut State Health Department, has been appointed Senior Medical Supervisor in the Bureau of Venereal Diseases in the Health Department of Baltimore, Md.

Southern States

HUGH J. BICKERSTAFF, M.D.,† of Atlanta, Ga., Associate Director in the Division of Maternal and Child Health, State Department of Health, has resigned to become Associate Professor in Public Health Administration at the Johns Hopkins University School of Hygiene and Public Health, Baltimore, Md. He is succeeded by ALDEAN STARR INGRAM, of Atlanta.

PAUL A. NEAL, M.D.,* Surgeon U. S. Public Health Service, and a member of the staff of the National Institute of Health, Bethesda, Md., has been detailed as Chief of the Division of Industrial Hygiene of the Institute. He succeeds R. R. SAYERS, M.D.,* who went to the Bureau of Mines recently.

DR. JOHN B. PLUM, of Nashville, Tenn., has been appointed as Tuberculosis Clinician in the staff of the Alabama State Department of Health, succeeding DR. CHARLES J. WESTOVER, of Anniston, who resigned to enter private practice in Michigan.

DR. HOWE K. RIDDLE, of Coweta, Okla., has been appointed Health Officer of Wagner County, succeeding DR. WALTER R. JOBLIN, of Porter.

DR. RAYMOND E. SMALLWOOD, of Little Rock, Ark., has been named in charge of the Garland County Health Unit.

DR. ALBERT W. THOMPSON, of Bentonville, Ark., has been appointed Medical Director of the Benton County

* Fellow A.P.H.A.
† Member A.P.H.A.

Health Unit, succeeding DR. JAMES B. TUCKER, resigned.

SIDNEY J. WILLIAMS, M.D., C.P.H.,† Health Officer of Sumter County, Livingston, Ala., has been appointed Director of the Commonwealth Fund Health Unit which has been established in Pike County, with offices in McComb, Miss.

DR. JOHN B. YOUMANS, of the School of Medicine, Vanderbilt University, Nashville, Tenn., is serving in Europe as a member of the Health Commission of the Rockefeller Foundation in charge of the nutritional phases of the health program. The announcement states that the work of the Commission will be in aid to the French in reëstablishing and reorganizing the health service of France.

* Fellow A.P.H.A.
† Member A.P.H.A.

Western States

DR. KEITH P. RUSSELL, of Portland, Ore., has been appointed Director of the Division of Communicable Disease Control in the Portland Department of Health.

JAMES R. SCOTT, M.D.,* formerly Professor of Health Education at the University of New Mexico, has been appointed State Director of Public Health of New Mexico, at Santa Fe, succeeding EDWIN B. GODFREY, M.D.†

Canada

DR. CHARLES W. MACMILLAN, of St. John, has been appointed Chief Medical Officer for the Province of New Brunswick.

CONFERENCES AND DATES

American Academy of Dermatology and Syphilology—3rd Annual Meeting. Palmer House, Chicago, Ill. December 8–11.

American Association for the Advancement of Science. Philadelphia, Pa. December 27–January 2.

American Camping Association — 18th Annual Convention. Wardman-Park Hotel, Washington, D. C. February 13–15, 1941.

American College of Physicians—25th Annual Session. Statler Hotel, Boston, Mass. April 21–25, 1941.

American Library Association. Midwinter Conference, Chicago, Ill., December 27–30. Annual Meeting, Boston, Mass., June 19–25, 1941.

American Medical Association — 92nd Annual Meeting. Cleveland, Ohio. June 2–6, 1941.

American Public Welfare Association. Round Table and Annual Meeting. Wardman-Park Hotel, Washington, D. C. December 4–8.

American Society for Public Administration. Chicago, Ill. December 29–30.

American Society of Civil Engineers. Winter Meeting—New York, N. Y., January 15–18. Spring Meeting—Baltimore, Md., April 23–26, 1941.

American Society of Heating and Ventilating Engineers—47th Annual Meeting. Hotel Muehlebach, Kansas City, Mo. January 27–29, 1941. (Summer Meeting—San Francisco, Cal., June 16–20, 1941.)

American Standards Association. New York, N. Y. December 11.

American Statistical Association. Chicago, Ill. December 26–28.

American Student Health Association—Annual Meeting. University of Michigan, Ann Arbor, Mich. December 27–28.

American Water Works Association—61st Annual Convention. Royal York Hotel, Toronto, Ont., Canada. June 22–26, 1941.

New York Section — Commodore Hotel, New York, N. Y. December 27.

New York Section—Syracuse, N. Y. March 20–21, 1941.

Pacific Northwest Section—Seattle, Wash. May 8–10, 1941.

Ohio Section—Cincinnati, Ohio. May 15–16, 1941.

Southwest Section—Fort Worth, Tex. October 13–16, 1941.

Canadian Public Health Association—Laboratory Section. Ninth Annual Christmas Meeting. Royal York Hotel, Toronto, Ont. December 16–17.

Florida Public Health Association. Tampa, Fla. December 5–7.

Heating, Piping & Air Conditioning Contractors National Association. San Francisco, Calif. June 16–20, 1941.

National Chemical Exposition and Industrial Chemical Conference (1st Biennial). Under the auspices of the Chicago Section of the American Chemical Society. Stevens Hotel, Chicago, Ill. December 11–15.

National Council of State Public Assistance and Welfare Administrators. Washington, D. C., December 4–8.

National Public Housing Conference. New York, N. Y. January 24–26.

National Society for the Prevention of Blindness. New York, N. Y. December 12.

Pacific Heating and Air Conditioning Exposition. Exposition Auditorium, Civic Center, San Francisco, Calif. June 16–20, 1941.

Second Southern Conference on Tomorrow's Children. Under the auspices of the University of North Carolina. Chapel Hill and Durham, N. C. December 5–7.

Smoke Prevention Association of America, Inc.—35th Annual Convention. Ansley Hotel, Atlanta, Ga. June 3–6, 1941.

Society of American Bacteriologists. Jefferson Hotel, St. Louis, Mo. December 27–29.

Society of Illinois Bacteriologists. Chicago, Ill. January 31.

University of Chicago, Chicago, Ill. Fiftieth Anniversary Year: October 1, 1940–September, 1941.

Western Branch, American Public Health Association — 12th Annual Meeting. San Diego, Calif. May 26–30, 1941.

Foreign

International College of Surgeons. Mexico City, Mexico. August 10–13, 1941.



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MEETINGS OF AFFILIATED SOCIETIES
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Society and Secretary	Next Meeting
ARIZONA PUBLIC HEALTH ASSOCIATION Marion E. Stroud, Room 100, Arizona State Bldg., Phoenix.	To be announced
COLORADO PUBLIC HEALTH ASSOCIATION *Helen Cannon*, 3136 York St., Denver, Colo.	To be announced
CONNECTICUT PUBLIC HEALTH ASSOCIATION Mario L. Palmieri, 43 S. Main St., Middletown	To be announced
CUBAN PUBLIC HEALTH SOCIETY Dr. Carlos Pineiro, Instituto Finlay, Havana, Cuba.	To be announced
FLORIDA PUBLIC HEALTH ASSOCIATION Edward M. L'Engle, M.D., State Board of Health, Jacksonville.	To be announced
GEORGIA PUBLIC HEALTH ASSOCIATION D. C. Fowler, 245 State Office Building, Atlanta.	To be announced
IDAHO PUBLIC HEALTH ASSOCIATION Herbert C. Clare, State Division of Public Health, Boise	To be announced
IOWA PUBLIC HEALTH ASSOCIATION Carl F. Jordan, M.D., State Department of Health, Des Moines, Ia.	To be announced
[illegible] PUBLIC HEALTH ASSOCIATION Donald Buckner, 69 Coolidge Avenue, Needham.	To be announced
PUBLIC HEALTH ASSOCIATION Jorie Delavan, State Department of Health, Lansing.	To be announced
PUBLIC HEALTH ASSOCIATION John W. Williams, Jr., M.D., State Board of Health, Jefferson City.	To be announced
MEXICO PUBLIC HEALTH ASSOCIATION Frank W. Parker, Jr., M.D., P. O. Box 1086, Santa Fe, N. M.	To be announced
[illegible]ERN CALIFORNIA PUBLIC HEALTH ASSOCIATION Margaret Blee, Instructor in Nursing Education, University of California, Berkeley, Calif.	To be announced
OHIO FEDERATION OF PUBLIC HEALTH OFFICIALS W. D. Bishop, M.D., Darke County Health Unit, Greenville.	To be announced
PENNSYLVANIA PUBLIC HEALTH ASSOCIATION C. E. Houston, Department of Public Health, Washington, Pa.	To be announced
PUBLIC HEALTH ASSOCIATION OF NEW YORK CITY Frank Kiernan, 386 Fourth Avenue, New York.	To be announced
SOUTH CAROLINA PUBLIC HEALTH ASSOCIATION Ruth George, State Board of Health, Columbia.	To be announced
SOUTHERN CALIFORNIA PUBLIC HEALTH ASSOCIATION Eunice Lamona, R.N., 6028 Harcourt Ave., Los Angeles.	To be announced
TENNESSEE PUBLIC HEALTH ASSOCIATION Dr. Robert H. Hutcheson, State Department of Health, Nashville.	To be announced
TEXAS PUBLIC HEALTH ASSOCIATION P. A. Kerby, State Department of Health, Austin.	To be announced
UTAH PUBLIC HEALTH ASSOCIATION S. E. Gilchrist, 105 South State St., Salt Lake City, Utah.	To be announced
WEST VIRGINIA PUBLIC HEALTH ASSOCIATION Dorothea Campbell, State Department of Health, Charleston.	To be announced
SOUTHERN BRANCH, A.P.H.A. P. E. Blackerby, M.D., 559 Sunnyside Drive, Louisville, Ky.	To be announced
WESTERN BRANCH, A.P.H.A. W. Ford Higby, 45 Second Street, San Francisco, Calif.	San Diego, Calif., May 26–30, 1941

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